

THE  
**SCOT'S GARD'NER**

IN TWO PARTS, *John Young*

The First of Contriving and Planting  
GARDENS, ORCHARDS, AVENUES, GROVES;  
With new and profitable wayes of Levelling; and how to  
Measure and Divide Land.

The Second of the Propagation & Improvement of  
FORREST, and FRUIT-TREES, KITCHEN-  
HEARBS, ROOTS and FRUITS:  
With some *Physick Hearbs, Shrubs and Flowers.*

*Appendix shewing how to use the Fruits of the Garden:*  
Whereunto is annexed

*The GARD'NERS KALENDAR*

---

*Published for the Climate of SCOTLAND*

By JOHN REID Gard'ner.

---



---

*Edinburgh, Printed by DAVID LINCOLN  
Partner, at the Foot of Heriot's Close.*

James Brown & Co. hand written & printed  
SCOTTS CARDNER

John & Co. IN TWO PARTS  
The first of October 1811

OF THE  
WITH A MENTION OF THE  
MILITARY AND CIVIL

The second of the Propagation of the  
The first of the Propagation of the  
The first of the Propagation of the

The first of the Propagation of the  
The first of the Propagation of the  
The first of the Propagation of the

THE CARDNER KALENDAR

BY JOHN REID CARDNER

BY JOHN REID CARDNER

THE CARDNER KALENDAR  
BY JOHN REID CARDNER

THE CARDNER KALENDAR  
BY JOHN REID CARDNER

THE CARDNER KALENDAR  
BY JOHN REID CARDNER



*To all the Ingenious  
To all the Ingenious  
To all the Ingenious*  
**P L A N T E R S**  
*In* SCOTLAND.

I Desire you to peruse this Book, for there are many things in it of singular use, which I could never find in any, and the substance of what I could find material (in the Practical part of Gard'nersy) improven and applyed home; whereby I presume it may be Satisfactory to you when you operate in the choise of Husbandry. Several weighty reasons induced me hereunto; as, the great necessity of right contrivance, whereby you may do your works, both orderly and cheap; The in-expressible need of Inclosing and Planting, whereby you may improve your estates to best advantage, both in Profite and Pleasure. And because the many Books on Gard'nersy are for other Countries and Climates, and many things in them more speculative than practical: this ensuing treatise may the rather be acceptable; albeit obnoxious to the undoubted censure of Criticks, yet when I reflect on my Innocency in the design therein (the good of my Country) I receive Encouragment. And that my Endeavours may prove Succesful, is the earnest desire of

JOHN REID.

P L A N T S

I have been thinking of you very much lately, and wondering how you are getting on. I hope you are well and happy. I have been very busy lately, but I have managed to find some time to write to you. I have been thinking of you very much lately, and wondering how you are getting on. I hope you are well and happy. I have been very busy lately, but I have managed to find some time to write to you.

# THE CONTENTS

*Of the First Part, which treats of Contrivance.*

## CHAP. I.

*How to make the Works about a House Regular.*

Sect.

1. *The Introduction.*
2. *The Model of a House.*
3. *The Foundation of Contriving.*
4. *To find the Central Line.*
5. *Example by a draught, how to place the Works.*
6. *How to do where confined or limited.*

## CHAP. II.

*How to draw by the Scale.*

1. *The use of the Scale.*
2. *The same described.*
3. *How to take Measures from the Scales.*
4. *How to proportion the Scale to any draughts.*
5. *To know what Scale any draught was drawn by.*
6. *How to diminish or enlarge draughts.*
7. *How to measure the distances on ground.*
8. *My methode of surveying Mechanically.*
9. *Instrumentally vide Trigonometry.*

---

The Contents of the first Part.

---

CHAP. III.

How to make Avenues and Walks.

Sect.

1. Some Generals anent Walks.
2. How to stake out the Avenue.
3. How to run a Walk through a Wood.
4. How to do over Hills and great distances.
5. To set off Parallels where obstructions are.
6. Figures for Avenues to end in, lead to, and pass through.
7. The distance of Trees in Walks.

CHAP. IV.

How to Plant Thickets and Orchards.

1. How they should stand by the fence.
2. Of the several Figures that will admit of order.
3. Of the several ways of planting.
4. The first way squair.
5. The second Rombusical.
6. The third Triangular.
7. A fourth depending on the first.
8. A fifth and notable way.
9. A sixth way observing the Central line.
10. The distance of Trees in Thickets and Orchards.

CHAP. V.

How to make the Kitchen-Garden.

1. The methode and draught.
2. The proportion and order of planting and sowing therein.

3. Of

## which Treats of Contrivance

### Sect.

3. *Of uniformity to be observed.*
4. *A place for Physick Herbs.*
5. *Of Walls, and of the distance of dwarfes, and Wall-trees.*

## CHAP. VI.

### How to make the Pleasure Garden.

1. *What draught I fancy best.*
2. *Of Boxing for all Gardens.*
3. *Of the proportion of Walks.*
4. *To lay Grass.*
5. *Of brick Walks.*
6. *To lay Gravel.*
7. *The orderly wayes of planting flowers.*
8. *Of Terrase Walks.*
9. *Of Ponder.*

## CHAP. VII.

### How to Level Ground.

1. *Of the Horizontal and sloping Level.*
2. *To proportion the Level to the ground.*
3. *How to do with bad lying Plots.*
4. *How to level great lengths.*
5. *How to do over obstructions.*
6. *Of the solidity of earth.*
7. *An Practise which is the cheapest way.*
8. *To bring in water in pipes.*

## CHAP.

CHAP. VIII

How to measure, divide and lay out Land, &c.

Sect.

1. *Wherewith we should measure.*
2. *How we should measure, exemplified.*
3. *How to part off, divide and lay out land.*
4. *Of the superficies of Solids.*
5. *Of their solidity.*
6. *Of Roots and mean proportionals.*

CHAP. VII

How to lay out Ground.

THE

THE  
CONTENTS

*Of the Second Part, which treats of the Culture of Plants.*

CHAP. I.

Of the several ways of Propagation.

Sect.

1. **T**He Introduction.
2. The several ways are,
3. First by Seeds.
4. Secondly by Off-sets.
5. Thirdly by Cuttings.
6. Fourthly by laying.
7. Fifthly by Circumposition.
8. Sixthly by grafting.
9. Lastly by Inoculation.
10. Of planting, pruning, &c.

CHAP. II.

How to Cultivate and prepare grounds.

1. Of Trenching
2. Of fallowing.
3. Several ways of improving Land.
4. Of the best and worst Soyls, and how to improve them.
5. What dungs and manures are proper for the Land.
6. What sorts are proper for the Plants.
7. How to make Hot-beds.
8. Of Watering,

B

CHAP.



CHAP. III.

How to propagate and order Forrest-trees.

Sect.

1. *How to govern them in Seminary and Nurserie.*
2. *When their Seeds ripen, when to sow, in what soyl, when they spring, &c.*
3. *How to transplant out Forrest-trees.*
4. *How to prune them.*

CHAP. IV.

Of Hedges or Inclosures.

1. *What I esteem best for Hedges.*
2. *How to plant and keep holly Hedges.*
3. *How to plant and keep Hawthorn.*
4. *How to make Ditches.*
5. *How to have trees round for Shelter.*
6. *Of fencing the Quicks from Beasts.*

CHAP. V.

How to propagate and order Fruit-trees:

1. *Observations on grafting, &c.*
2. *What soyl they delight in, and how propagated.*
3. *To raise stocks and govern young Trees in sem: and Nurserie.*
4. *How to transplant out Fruit-trees.*
5. *How to prune both the Wall and Standard.*
6. *To prevent and cure the diseases of all Trees.*
7. *To destroy vermine, &c.*

CHAP.

CHAP. VI.

Of Fruits, Hearbs and Roots for the Kitchen.

Sect.

1. *Of the Fruits of smaller Plants.*
2. *Of Salads and Pot-hearbs.*
3. *Of sweet Hearbs.*
4. *Of Roots.*
5. *Of Weeding in General.*

CHAP. VII.

Of some Phylick Hearbs, Shrubs and Flowers.

1. *Phylick Hearbs distinguished into Perennials and Annuals.*
2. *Shrubs distinguished into dry and green.*
3. *Flowers into Fibrous, Bulbous, and Annuals.*
4. *How to preserve the tender sorts in Winter.*

---

A P P E N D I X

How to use the Fruits of the Garden.

1. *The manner and season of gathering them.*
2. *How to preserve them when gathered.*
3. *Of their uses.*
4. *How we may have dishes of them.*
5. *How we may have drinks of them.*
6. *To choise their species for our Plantations.*

---

## CONCLUSION

*Proposing Scotland's Improvement.*

*The GARD'NERS CALENDAR,*

*Shewing in each Moneth*

*When to performe the particulars, &c.*

*What Garden dishes and drinks are in season.*

---

THE

---

## THE FIRST PART

*Treating of Contrivance.*

## CHAP. I.

*How to make the Works about a House Regular.*

First and a Second part I thought necessary, that I might discuss things in their order: for a House must be built before it be furnished. These who inclines not to read this may step forward to the Second; perhaps there they will find Satisfaction, albeit others may be as desirous of this, who have any works to make.

My designe by contrivance, is to prevent the consequence of Inadvertancy, or the abrupt procedure in Inclosing and Planting.

2. Here in the entrance you may take a view of a House which I have Invented (See Fig. 1.) it is but little, yet very commodious & Cheap. There is only 4 Rooms on a Floor (you may have Closets within the wall, although not here demonstrated) all which enter off the Stair (yet communication betwixt) and the door is in the middle, & there is 10 steps up to the first Story, (which is hall or dining Room, withdrawing Room, Bed-Chamber and Waiting-Room) and 10 Steps down to the lower Story, which is half under ground and vaulted, this is Kitchen, Cellars and Ladners, &c. That above the dining Room story may be Bed-Chambers, library and withdrawing Room: and above these garrets for wardrops. The Roof may be in three, so as the middle part may be flat and covered with lead and the two sides more steep & slated: there is also a Stair coming down

from the hall without to the parterre of grass and gravel, on whose corners are two Pavilions opening without the line of the House and sets off in place of Iammes; one of which may be a Store-house, and the other a Dove-house: the Stables, Baking and Brewing house are on the opposite side, most conveniently placed, as hereafter I shall demonstrate.

3. Situate your House in a healthy Soil, near to a fresh-spring, defended from the Impetuous-westwinds, northern colds and eastern blasts: and mind regularity, *viz.*

Make all the Buildings and Plantings ly so about the House, as that the House may be the Centre; all the Walks, Trees and Hedges running to the House.

As the Sun is the Centre of this World: as the Heart of the man is the Centre of the man: as the nose the Centre of the face: and as it is unseemly to see a Man wanting a leg, an arme &c. or his nose standing at one side the face, or not streight, or wanting a cheek, an eye, an eare, or with one (or all of them) great at one side and small on the other; Just so with the House: courts, Avenues, Gardens, Orchards, &c. where regularity or uniformity is not observed.

Therefore whatever you have on the one hand, make as much, and of the same forme and in the same place, on the other.

4. But if you would work right, beginne orderly, that is, find the central line by erecting a perpendicular on the middle of the House-front, to extend as farr both back and fore as requisite: hence you may draw parallels, Measure and Stake out your Avenues, Gardens, &c. as you please: ever minding to Measure alike at both sides of the Central line; How to find this Central line and to set off parallels is taught in Chap: 3: Sect: 1. and 2.

Yet for further Illustration take an example by a draught of my own inventing (see fig: 2.) which if rightly understood may be applyed diversly and Improven elegantly.

It is here in a small Scale. the House is in the Centre, and at B, round by the House is Balesters, the Common Avenue is by N, and

and ends in a triangle, *c*, is the outer Court, and in the two triangular Courts marked with O, are placed the office-houses most notably (with their back part to the Court *c*,) opening without the line of the House: So dismounting at the gate of the Court (through which you may walk on foot to the House) let the Horses be taken about to the Stables by the Way the ending of the Avenue leads. The two plots P, may be Ponds, the two with G, Cherry Gardens: a proper place also for gooseberries, Currans, and Strawberries. On the south side the House there is the pleasure or Flower-Garden called the *Parterre*, at the two sides thereof Kitchen-Gardens marked with K, then another Walk ending in a Semicircle at S, Leading out to the Lawn or deer Park. The vistas or walks of view that runs from the 4 Angles of the House are very pleasant and convenient, and are good Shelter; for which cause there are two Thickets on the north side marked with *t*, on the south side are two such marked *a*, for Nurseries, and at E, and W, are two Orchards. The whole is environed with two rows of Forest Trees without the wall: And if the paper were large I would shew you that the Park Wall should be parallel to these, that is, every where equidistant from the House its Centre at least, the whole an *octagone* near to a regular *polygon* consisting of equal sides & Angles. The walks with their fences (being run forward from all the 4 sides and 4 Angles of the House till they touch at the middle of each side of the Park Wall,) serves in the Park for dividers: which dividers may be hawthorn Hedges, and these in the Gardens holly, except the Court in the entrie and office-house Courts, methinks walls are requisite there. Also there should be an ascent to the House, (if possible) as at the first Court gate 2 steps, at the 2d 4 steps. &c. But Leaving it to let every man apply as his ground and ability will be admit, I come to speake of regularity, where confined.

6. But as to work or make regularity among confinements, requires Ingenuity; so is there difficulty in teaching the same, because of the great variety of places: and being that I know not how to give precepts for it (except what is said above of the Centre and Central line)



line) therefore I shall only instance in by example.

As where I was confined, to add what I will, but to diminish none. I viewed the works, and found several regular and Irregular things don on the one side the House, and nothing on the other answerable: therefore I Staked out the same on the other; still where I found an Irregular piece on the one side, I staked out the very same on the other; and thus two Irregularities produced one uniformity.

Or where there had been much wrought for ane Avenue, but did not Front the House right, by reason of a precipice on the west hand. I got on the house top, viewed the ground immediatly, saw that I might turn my face towards the East and get stately Avenues with Gardens on each hand at pleasure, and the said precipice turned at my back.

But to draw any place first on Paper, as they stand, we see faults plainly, and how to help them accordingly: Therefore to assist you further in making your works orderly I shall shew you in the following Chap.

---

## CHAP. II.

### *How to draw by the Scale.*

**A**ll draughts not drawn by the Scale ar but suppositions, the Scale makes them stand directly on Paper as on ground, or would stand, if put upon it: therefore of singular use in contriving, you should have ane eye to the consequence of all your undertakings, lest you run Inadvertantly into a snare: for when you have determined or settled on the contrivance, perhaps hath gone a great length in working the same, yet as you proceed (one thing making way for another) you may come to see a far better way, and so to overturne most or all that is done, to get your new and better way accomplished; which obliges you either to double pains & Charges, or otherwise, in saving the same, to sit still with a dissatisfied mind; all which may be easily and timely prevented by drawing & projecting on paper, as is said.

2. You



2. You may make as many Scales as you think will be needful, inſomuch that when you have a draught at any time to draw, you have no more to do, but by Arithmetick find which of them Scales you muſt draw it by. Therefore make a Thinn broad rule 2 foot long Pear or Aple tree, Red of Plumtree, Planetree, Boxwood, or Brals which is beſt: put as many on both ſides as it will contain. I make moſt uſe of a Diagonal Scale, (ſee fig. 3.) its done by dividing the Inch into ſo many equal parts, as 8 in the Inch, 30 in the Inch, 100 or 200 in the Inch, the figure and Multiplication will informe you for 5 diviſions, drawn the length of the Rule and 7 in the Inch; the other way is a Scale of 35 in the Inch, 5 times 7 is 35 and ſo forth. If your Rule be 2 foot, there may be 2 Lengthes on it, or as your largeſt Compaſs may conveniently reach. You may alſo make ſome of the common Scales, that is, divide the Inch the ordinary way in a ſtraight line into ſo many equal parts (ſee fig. 4.) ſeeing the Diagonals hath only ſuch as Multiplication produceth.

3. If you be to draw a draught, but knows not how to take your meaſures from the Scale, then if you know the meaſures on ground take ſo many diviſions (off the Scale with your Compaſs) as you had feet, ells, or falls (whatever you meaſure by) and ſet on the Paper: example, if you were to draw an orchard whoſe lenth is 680 ells by a Scale of 200 in the Inch (as the upper end of fig. 3.) you are to conſider how many times 200 is in 680, that ſo many whole Inches you may take on your Compaſs, and the odds or fraction you may get therewith from the ſubdivided Inch: here if you ſet one foot of the Compaſs at 6 and reach the other to *a*, which 6 half Inches is 600, and 8 diviſions foreward on the ſubdivided half Inch is 800; the ſame you may place on the Paper & draw accordingly. Example 2. by the other Scale of 100 in the Inch, if you would ſet the breadth of 23 foot walk on Paper, here it is not one Inch, therefore you muſt take but ſuch a part of one Inch, *viz.* Set the Compaſs from the end of the ſubdivided half Inch to *o* in the ſame, and draw on the Compaſs; therefore do as before. You may perceive that the 23 diviſions on the Rule is the 3 from 20 foreward on the line betwixt 20

and 30 where the 0 is placed to make it plain. If your draught be so large that your Compass cannot reach its length, then you may divide the same by 2, 3, or 4, &c. and take the product on the Compass and set alongst so many times as was your divisor. This is so plain that it needs no example.

4. But if you have a draught to draw on one or many sheets of Paper, and you desire to draw it as large as the Paper will bear, not to go off; Then take the length of your Paper in Inches, by which divide the length of your ground whether feet, ells, &c. and the quotient shall be the Scale you must draw it by; that is, an inch divided into so many equal parts. Example, if you have a plot 360 foot in length to draw on a sheet common Paper 16 Inches: but to make it, keep a little within the Paper, at each end call it 15 inches; so 360 the length of the ground divided by 15 the length of the Paper gives 24: therefore take a Scale of 24 in the inch, and draw it by the same. Example 2. the breadth of a field 864 Falls, I desire to draw it on the  $\frac{1}{2}$  of a sheet viz. 3 Inches. Divide 864 by 3, it gives 288, but this being too small, I take the  $\frac{1}{2}$  thereof viz. 144 and drawes it by the same, mynding that each division on my Paper is 2 Falls on ground.

5. Or if you had a draught, and knowes not what Scale it was drawn by, if you know what ground it contains, the work is first, to measure it by a supposed Scale, and secondly to find a mean proportional betwixt the true quantity of Acres and that quantity found by the supposed Scale. And thirdly by the golden Rule say, as the quantity of Acres found by the supposed Scale is to the mean proportional: so is the supposed scale to the true Scale. Example, if you have a plot or field of ground containing 72 Acres, and you measure it by a Scale of 18 Falls in the inch, and that makes but 40 $\frac{1}{2}$  Acres, the question is what Scale was it drawn by? You will find the mean proportional betwixt 40.5. and 72 to be 54 (as in chap. 8. sect. 6.) and as 40.5. is to 54: so is 18 to 24. Thus it appears that the said plot was drawn by a Scale of 24 Falls in the inch.

Exam-

Example 2. If you have a plot (containing 14 Acres 64 falls, and measuring it by a Scale of 40 in the Inche makes 90 Acres, what Scale was it drawn by? You will find (as is said) the mean betwixt 14.4. and 90 to be 36: therefore as 90 the Acres found by the supposed Scale, is to 36 the mean proportional: so is 40 the supposed Scale to 16 the true Scale. This tells that it was drawn by a Scale of 16 in the Inche.

6. But if you have a draught, and knowes not what Scale it was drawn by nor what ground it containes, so as thereby you might find its Scale, & you desire to diminish or Enlarge the same on Paper, and yet that it may bear the same shape and proportion in every respect.

You may divide or multiply every particular line or part of it: as if you would have it  $\frac{1}{3}$  less, then divide each part by 3, and take one of these and set on the Paper. Or if you would have it twice as large, then double every part and portion of it, that is, take the double of each length and breadth on the Compass and set on the Paper and draw accordingly.

But if your draught be a Taliduce, Mapps, or the like, draw a squair by the outer edg thereof, and divide each side into so many equal parts, as you think fit; betwixt which draw parallel lines all through crossing from opposite sides, and notice what part of your draught falls within the precinct of each little squair, & so Copy it upon another Paper whether larger or lesser, as if you would have it one fifth less, take one fifth of the side of one of the little squairs, and therewith Lottrie or square your clean Paper. And likeways take one fifth of length and breadth of each particular within each little squair, and the one fifth distance that such and such parts, creeks and angles are distant from any two of the angles of the same; and so place them accordingly in the lesser little squairs of your clean Paper.

7. When you designe to survey any plot of ground be careful in measuring the distances truly, and keep exact accompt thereof. You may make first a supposed figure on a Paper before you begin, that thereon you may write your measures, as you go along: as it is be a

Hexagon, (see fig. 27.) draw a figure at random containing 6 sides, and having observed the meridian on the ground (which you may either find by the Compass or let the central line of the House its perpendiculars or parallels serve in lieu thereof) mark down such on your supposed figure; then let the two men with the chain begin at any angle; the foremost may have 10 small sticks to thrust in at every length of the chain, & let the hindermost man gather them up as he comes along; and when all up, give them to his assistant to begin again, as before, calling that one change. (still being carefull to go straight betwixt the two ends or extreames) and when you come at the other end, compt how many changes, chaines, and links, as if the hedg *c. d.* be 70 Fells, write that down as in the figure, and so proceed to the rest observing the same methode.

8. But albeit you measure round any plot or Field, yet you must know how to find the quantity of the angles, and protract the same: therefore I shall shew you the most exact of all others and mechanical too. Example by fig. 21. When you have measured the length of the 4 sides of this Trapezia (as is taught) then measure also betwixt any of the two opposite angles, as from *c.* to *b.* or from *d.* to *a.* and then you may protract it only with your Scale thus: draw a given line on the Paper as *a. c.* and from your Scale take so many divisions as was the lenth of the hedg *a. c.* and set thereon; and take the lenth betwixt *c.* and *b.* on your Compass; set one foot in *c.* and describe an obscure Arch at *b.* also take the lenth of *a. b.* and setting one foot in *a.* make another Arch to cross the former at *b.* then draw the line *a. b.* likewayes take the length of the side *b. d.* on the Compass, set one foot in *b.* describe an obscure arch at *d.* and take the length *c. d.* & with one foot in *c.* cross the former at *d.* then draw *c. d.* and *b. d.* and so have you finished. By the same its easie to protract fig. 26. and 27 or any other, and this is my method of Surveying.

6. As for the dimensions of Circles, see Chap: 8. for having the Radius, you may easily find all things belonging thereunto.

As for straight lined figures, if you reduce them into Triangles, & measure the three sides of each, you may protract them, as is taught: thus.

thus Trigonometry or the doctrine of plane Triangles shewes, that having any three things in a Triangle, we may find the other three, either by the Scale or by Artificial Sines, Tangents, and Logarithms: as having three sides, or three angles, or one Angle, and two sides, or two sides and one Angle, &c.

I will give you an example by Fig: 20. suppose you would have the distance between B. and A. First measure off from B. (at any side most convenient) so many ells or fells, the more the better, I shall here suppose 384 fells to C. (as will appeare by a Scale of 400 in the Inch) and in setting it off, notice what degrees that angle makes by your prorektor, then hold the same at C. with its Chord line on B. C. Turn about the Index till it poynt to A. notice what degrees it cutts, as suppose 80. and write down: here you have the side B. C. 384. the angle A. B. C. 60. and the angle B. C. A. 80. (and by consequence the Angle B. A. C. 40. being its the complement to 180.) therefore go to your paper and draw a given line as A. B. then open the compass to the radius of your line of Chords, & therewith setting one foot in B. Discribe the Arch D. E. I. O. likwayes take 60 degrees with your Compass off the line of Chords, & set from D. to E. on that Arch line, and by the poynt. B. and E. draw the line B. E. C. so shall the Angle. A. B. C. contain 90. degrees. But if the Angle had fallen to be more than 90 degrees, then you may take it at twice (seeing the ordinary line of Chords has but 90) as if the Index had Cut 120. first take 90 upon the compass and set from D. to I. then take 30 and set from I. to O. which Angle. A. B. O. contains 120 degrees. But to return, as you set off the Angle at B. so likewise at the Angle C. make an Arch and set off 80 degrees thereon, by which poynt and C. Draw the line. C. A. lastly take the line B. A. on your compass (i. e. betwixt the poynt. B. and the poynt at A. where the line. C. A. did cut the line. B. A.) and apply to the same Scale of 400 in the Inch, from whence you tooke the 384. and you will find the distance betwixt B. and A. to be 588 Falls: for,

As the Sine of the Angle B. A. C. 40 degrees . . . 9: 808067  
 is to the Logarithm of the side B. C. 384 falls: . . . 584331  
 so is the Sine of the Angle B. C. A. 80 degrees . . . 9: 993351  
 The summe of the 2<sup>d</sup>. and 3<sup>d</sup>. added . . . 10: 577682  
 The first number to be subtr: from this sum 9: 808067  
 To the Logarithm of the side A. B. 588 falls . . . 769625

If you would know how to find the superficial content of any plot of ground, or how to divide the same, or to lay out any quantity of land in what forme soever, &c. see Chap: 8. for, I haſt to.

### CHAP. III.

#### *How to make Avenues and Walkes.*

**A**LL walkes should front the gates or entries, whether they lead to a house, Garden, Gate, Door, Park, Wood, or highway. When you have determined on the end of the walk as the door of the house, in the middle thereof on the line of the House-front set off a perpendicular, to find the central line as aforeſaid, ſee Chap. 1. Sect. 4. and for your more exact performance thereof prepare this Instrument, viz. take two ſtraight Rules about 3 or 4 foot long, joyn them Croſswayes in other, ſo that the 4 Angles where they cutt may be exact ſquairs; then at each end of theſe, joyn a piece Rule ſtanding up about 4 or 5 Inches, and in the exact middle of each of theſe pieces make a ſlit up and down, and in the middle of theſe ſlits a piece ſmall ſilk threed; theſe being ſtraight and perpend: up are excellent to view by. Place this croſs on the head of the three footed Staff, hing a Plumb whereby you may plant it Horizontale upon occaſion: on this you may alſo place your proreſtor with the box and needle, when you go to ſurveying; for every one has not a plane Table.

As



As to the Avenue, set one side of your cross parallel to the given line (the House-wall) this you may do with most ease, by taking one end thereof within the door till the side touch the door cheeks, and you may also view cross by the side-wall back sight and foresight, till it stand exactly Parallel thereto: then turne, and standing within the door, view straight out by the silk threads, and so direct one to drive stakes all along so farr as you can see, in a straight and perpendicular line. You may also find this perpendicular central line, tho Walls, Hedges, Houses, Trees &c. obstruct, if you can see over them out at any Window or off the Battlement if there be any, otherways recurre to the Rules in Sect. 3. and 4.

And as by this Instrument you may raise any perpendicular, so by the same you may let perpendicular fall: for you may alter it hither and thither upon the given line, till it direct to the angle or point assigned.

2. The mid or central line of your Avenue being found out you must place your cross thereon, and thereby set off the half breadth thereof at each side: do this at both ends and middle, that they be exactly Parallel; and therein drive stakes almost to the head. And when you come to marke out for the Trees, or to plant them, set a straight pole at each driven stake, for your direction in going straight betwixt the same.

If the length of the walke be confin'd, divide it by the distance you mynd to plant at; and if there be any odd, add or subtract till all the distances be equal; which distance you must take on a chain (for a line will reach and shrink) and begin at one end, and go straight to the other, thrusting in a small stake at each length; minding to let both rowes go on squair together, that is, one on each side and viewing will find the other two, if there be fower rowes, see the Avenues fig. 2.

And though the ground be unevenly, yet you must hold the chain level: wherefore you may have a squair & Plumb fixed at your pole or staff for your more exact performance thereof.

When



When you have staked out the ground, prepare the rounding string *viz.* a piece line doubled and tyed near the point of a stick, and so put the double on the stakes where the Trees must stand, and stretching the same, make a scratch with the point of the stick round; and with a spade follow that Compass and make the hole. See the second part of this Treatise, where there be directions how to prepare the ground and plant.

If you observe what is said, you may stake out any kind of walk, having one line found; wherefore I shall shew you how to find out one line whatever obstruct.

3. As first, suppose you would run a line or walke through a wood: when you have concluded on the end thereof, there erect a perpendicular as above, and run it as farr into the wood as you can; then at each side thereof set off a Parallel line two or three foot from the central line, or half the breadth of the intended walk: so shall you have three Parallel lines running on in straight lines together. And where any one runs on a tree, run foreward the other two, and set it off again (when past the Tree) as it was Parallel to its fellowes, and so proceed till you be through the wood, or thickets, still marking the Trees that falls in the intervall to be cut.

A second way is by means of Lanthornes with burning Candles, in a calm night when dark hanged on stakes, you standing in the wood may plant stakes at pleasure, let the Candles furthest from you be highest, and remove foreward the lights as need requires.

4. But if both ends of your walk be determined, and you cannot see betwixt, by reason of Lengthes, Hills, Woods, Houses, or some such obstruction, in such a case let two having each a pole go to the middle or to such a place betwixt where they may (by looking back sight and foresight) perceive the two extreames, (where should be a pole with white Paper on the slip boards to make the better appearance) turn your faces towards other, standing at a large distance asunder, but so as you may both see your respective objects. And let A direct B to set the pole in line with his and that at the North-end; and B direct A to hold in line with his and that at the South-end;

end: so each directing other by words or Signes; let both alter to and fro, till they have their desires at once; then shall these two and the extreame be all four in a straight line, whereby you may set as many as you please. This way I found out by experiment, and thinks it worthy a place amongst the Mathematicks.

But if you cannot see the two ends, when standing in the middle; although the Poles be never so high, then if it be Wood or Hedges, the foresaid Lanthrons and Candles will do the business.

But if the obstructions be Hills, Walls, or Houses, for which you cannot see, standing in the middle, as a-foresaid, neither by Lanthrons, nor yet by high Poles; then do by Parallels thus: set off a parallel line so farr, as that it may run quyt beyond the obstruction, (on the side most convenient) then set in the parallel again at convenient places; so shall both agree, and as will appear when the obstruction is removed.

But if none of these will do, run a line over by guess, and if it miss (as no wonder) take notice of your Error at the end, by letting a perpendicular fall on the determined poynt (by means of the squair or cross) and the measure betwixt finds out the Error: then measure the length of your intended walk or line, aforesaid; and at the quarter thereof, set off the  $\frac{1}{4}$  of your Error: At the middle the  $\frac{1}{2}$  and at the  $\frac{3}{4}$  of the length, set off the  $\frac{3}{4}$  of your Error; this will lead you straight upon your purpose.

Trigonometry will also solve this, if you could work exactly: for here you have two sides and one angle; see the last Chap. Sect. 9.

5. And if you have a given line and desires to set of a Parallel therefrom, but cannot measure off at both ends as is needfull, there being Trees, Waters, Hills, Walls or Houses, obstructing, you may measure, Squair or Perpendicular off at any part of the given line (that is most convenient) so far as you mind to go with your parallel; at, or upon which point erect another Perpendicular to run back-

sight and foresight; the which shall be exactly parallel to the given line, as was required.

6. Having given some directions for staking out walks for Planting, yet your Avenues and Walks must end in some figure or another, whether Triangular, Circular, Oval, &c. For Coaches and Carts to turn in, as also where Walks meets, or Cross other, its requisite that there be some figure for the same reason.

How Avenues may end in Semicircles and Triangles, see fig: 2. and if it end in a Semicircle, it may begin with the same or rather (if the ground will suffer) it should begin with a whole circle having lower opposite opens the breadth of the walk: If it end with a Triangle, it may begin so likeways, but rather with a squair (the endings Integer) whose entries or opens must be in its Angles. And also where the Walkes meets or Cross, I have a little figure or Open, see fig: 2. And yet the Trees in the whole draught every way lineal, except in the segment of a Circle, where they deviat a little. The figures should be at least three times the breadth of the walk, but so as the ground will admit; let not the Trees in the figure stand much above half the distance of these in the walke, but divide equally, make the breadth of the walk in proportion to its length: I think an Avenue a mile in length may be 40 ells in breadth, see Chap: 5. sect: 2. neither short Broad nor long narrow walkes are handsome, except in case of walkes of Shade, & also of Avenues where the Front of the house, Jammes, courts, or pavilions ar to be observed: for the breadth of the court should be at least the whole length of the House-front; & if two Jammes the middle walke of the Avenue may be the breadth betwixt, and the side-walkes the breadth of the Jammes; or the middle walk the breadth of the whole Front, & the side walkes the breadth of the pavilions, which ar on the corners of the Court; or divide the House Front in three, making the middle walke the just breadth of both the side ones: so shall they be every way lineall, but do not mask a fine Front nor veyle a pleasant prospect. The length of the Avenue, it should run so farr as (when we stand at the house) we may lose sight of the farr end, if possible. When it runs over a Brae, then

to the eye it appears *Infinitum*, and where that cannot be had, it doth very well where the sight terminates in a grove or circle of Firrs.

7. The distance of Trees is sometimes according to the quality of the ground, or Trees to be planted, sometimes to the number of Rowes, or as the figure to be planted will best admit. If a good Soyl, plant at the wider distance; if 4 Rowes, as an Avenue. Plant at 5, 6, 7, or 8 ells distance; if 2 single rowes at 4, 5, or 6 ells; if Circular figures or the like at 2, 3 or 4 ells, or as the figure is in smallness or greatness, and Plant so as they may shew the figure well.

Some Trees requires wider distance than others, these that grow greatest, by consequence must have the largest distance, see the next Chap: sect: 10.

Note, that you Intermix not great Trees and small Trees in Planting, neither quick-growers and slow-growers: for I observe a kind of Emulation amongst them.

For Inclosures See part 2. Chap: 4.

### CHAP. IIII.

#### *How to Plant Thickets and Orchards.*

**A**S the ground where you Plant must be Inclosed, so must the Trees stand some distance off the fence: if it be a wall whereon or Wall-Trees, let the standards be at least one of their own distances from the same, & if you designe fine walks round by the wall, Plant the Row next thereunto with Dwarf-Trees or some low Hedge, and the Trees half a distance off such; if the inclosure be a Hedge, observe the same Rule. Also let the Trees be Parallel to the Inclosure: but every Plot will not suffer to be Planted every way lineal and stand Parallel to the Inclosure too; therefore it will be necessary first to Inquire a little what figures they be that may

thus be Planted, (a thing I never saw Inquired) And secondly how to plant those that will not admit of this order, and lastly how to plant the several wayes.

2. The figures that may be planted every way in row ar many, yet for Brevities sake I shall mention but some as oblong, & geometrical squairs (see fig: 5. 6. 7. 8. 9.) Rhombus (see fig: 10.) Rhomboïdes (see fig. 11.) Oxigone or Equilateral Triangle (see fig: 12.) Orthygone or right Angled Triangle (see fig: 13.) Ambligone or Triangle with one obtuse and two Acute Angles, (see fig: 14.) a sort of Trapezia, (see fig: 15.) Hexagone, (see fig: 16.) Octagone (as the whole fig: 2.) these regular Polygons ar the nearest way for Planting a Circle.

Many more figures there be both Regular and Irregular that will admit of this order, but these may suffice for Illustration. As for these that will not, you may Plant them Parallel, to as many sides as you can, and let the rest, fall as they will.

3. Now as to the several wayes so farr as I know, there is but three principal wayes of Planting, every way lineal (although there be more built thereon) *viz.* Squair, Rhombus, and Triangle: In the first, three of them makes a right Triangle, and fower of them discribes a Circle; (see Fig: 5.) In the second, three of them makes a triacute Triangle, and fower of them discribes an Elipsis (see fig: 6.) note, that this way will admit of Variation. In the third, three of them makes an equilateral Triangle, and fower of them discribes an Ovall, (See Fig: 7.) And seven of them makes a Circle with a Centre, See Fig: 17.

4. The manner of Planting the first, which is the common way is exemplified in Fig: 5. take the length of one side, and divide by the distance you mind to plant at, and the product tells how many, and whats over, if there be any, you may proportion as before. Then with your determined distance on a chain, begin at a Corner and go round the out-line exactly, where the outter row must stand, thrusting in a stake at every length; these being in straight line and at equal distances, also straight bodyed and perpendicular up. The way is thus: One must stand at W. and view to E. another at S. and

and view to N. Causing a third set a Stake in line with both as at L. So removing from Stake to Stake (viewing still to the opposite) direct the third by words or signes till his Stake be in line with both: thus proceed till all the plot be Staked out. See Fig. 5. The way the Trees will stand when Planted.

But if the ground be unevenly, cause the Stake-setter, hold up a long and straight pole (with a plumb Rule for holding it perpend:) and when he removes, to thrust a stake exactly where the pole stood: but if the pole will not do, let the viewers mount them on three footed or standing leathers; and if that will not do, betake to the Rule, mentioned in the last Chap, for taking a line over a Hill, where both ends are confined, as I have done, in the like case.

But because some scarcely knowes signes, the Stake-setter must be told that when the viewer stands his face northwards and waves the right hand Eastward, that he must go a little east with his Pole, and when he waves the left, then westwards, when both his hands are once east or west, then he must hold the head of the Pole (if he have no plumb for his direction in this) but when the viewer moves both Hands, or Hat, up and down, then the Stake-setter must fix there.

5. If you Plant the second way in a squair, the out-line round is not equal distances tho' the opposites side are, here in this example one side is about 12 and one halfells distance, and the other 15. and the viewing being Angular, and not from opposite sides makes the Trees stand about 10 and one halfells.

But if you will Plant Rombusoical, as is designed, then its done by the equal division of its fower sides, and by viewing to its opposits, as the Rombus A. B. C. D. Within Fig: 6. Doth represent; for though its Angles be not squair nor equal, yet its sides must be equal, and Angles opposite: and here it may be varied, as is said according to the shape of the ground, by streatching longer or opening it wider. A. C. is its breadth and D. B. its length. Or you may also plant by the Romboides, as I have done, D. A. E. F. & consequently many more figures may be planted thereby as well as these may be,



varied or altered, and yet all continue in this *Cyrus* order.

6. In the 3d way take an example in Fig: 7. where the length of one side must be divided by the determined distance *viz.* the distance off the fence being subtracted, the length of the side A. B. is 119 and I designe to plant at 8 and ane half ells: therefore I divide 119 by 8.5. decimally, the product is 14 distances; then there will be 15 rowes; here one side is Staked out, whereby you may Plant the whole plot thus: take two distances on the chain, that is, hold one end exactly at A. And the other at C. Again with that measure on the Chain, hold one end at the first Stake (*viz.* A.) And the other at the second (*viz.* L.) cause a thrid take the chain by the exact middle, and (holding it stiff) thrust in a straight stake at the Angle of the Chain (*viz.* N.) so those three makes an equilateral Triangle; then remove, holding one end at the second Stake (*viz.* L.) And the other at the thrid *viz.* C. Stretch the Chain and thrust in a Stake at its Angle or middle as before. Thus you may proceed from Stake to Stake till that row be Planted: and so on from row to Row till the whole Plot be Staked out, minding to set the Stakes straight and Perpendicular, considering their thickness also; in all which if you be not very exact, ye cannot avoyd error before you come at the other side. Therefore I shall shew you another way of my own Inventing, which is more sure and exact & less paines, *viz.* Let first that one side be marked out, as before, and having set two or three Stakes of the second row, as is just now taught; then upon two, hold to the Chain, and Plant another Stake to begin a thrid row; (as at D.) then take the exact distance betwixt L. and D. On the Chain, and therewith Stake out the side B. R. And because there is one Odd Row, take the exact half of that distance (by doubling the Chain) & set from R. to L. then with the whole length go betwixt B. L. thrusting in a Stake at each length, and here you shall find three distances and the half that was set off at the Angle R. Thus two sides are Staked out, and he that can do this, can also Stake out the other two, seeing the opposite sides are answerable: for as A. B. is to H. L. so is L. B. unto H. A.

When the plot is staked out round, let one stand at X, and view

to



to B. & another at O. and view to R. cause a third, set a stake in line with both, as at Q. Thus you may proceed from stake to stake, till all the plot be marked out, still minding the way of your viewing.

A Plot will contain more Trees this way, than any other example. The two Plots, fig. 5. and 7. are both alike in shape and quantity, each containing one Acre, 2 Roods, 16 Falls, 30 Ells: and fig. 7. holds 11 Trees more than fig. 5. planted at one and the same distance.

7. A fourth way of planting, is that which I ordinarily use in thickets: (see fig. 8.) for when the Trees grow large, every other row (suppose the short ones) may be taken out, that the rest may have freedom, and so be benifited by Sun and Air, where one Fruit-tree will bear more than fower crouded on others, and yet continue in as good order; and in part answers some complaining while their Orchards are young, as having few Fruit, seeing the more Trees there be while such, the more fruit to be expected, therefore when their branches begin to meet, remove them as is said, lop and plant by your Hedges, I mean by the divisors of your Corn Land, and they being now great, are able to defend themselves. Its also applicable to Forrest-trees. seeing while they are young, they afford little Shelter, except more than ordinary thick, and yet when they grow large cannot prosper to that stately magnitude, unless the same cure be used, viz. the removal of each second row, which may be effectually planted about the Bordures of your Corn Land, Meadow and Pasture, who now needs no fence save a few thorns hanged about to keep the Cattle from Rubbing, which thornes they are now well able to bear, albeit small Trees are not: for the winds take great hold on such. Moreover in Orchards, if the short Rowes be Cherries and Plumes; they not being long lived, will be past their best e'r the Apples and Pears (which may be in the long rowes) require their Room from them.

As to the methode you must mark out the plot round about, as in my first, and view from Angle to Angle of each Geometrical squair;  
but

but then the distance of the outter Row about, must be more than in the first way, otherwise the Trees will stand much nearer. As 7. is to 5. so is the distance of the outter row about to the distance of the Trees through the Plot.

Or you may plant it by viewing from opposite sides, as in my first way, only you must plant the out-line of stakes round about, at half the former distance, and let the Stake-setter pass by every other distance (except you mean to plant Goosberries, and Currant-Standards in these blanks, and then the Trees and Shrubs together makes it intirely one with the first way,) and now the proportion is, as 7 is to 10: so is the distance of the outter row about, to the distance of the Trees; or as 10 is to 7: so the distance of the Trees to the distance of the outter row about. Such proportion doth the side, and diagonal of a Geometrical squair, bear the one unto the other exact enough for our purpose.

8. The fifth way, and very notable, where Orchard and Kitchen Garden are all one, or where you have Corn or Grass amongst your Trees, or Trees (whither barren or Fruit) among your Corn or Grass. (*see fig. 9.*)

If for Kitchen Garden, divide it in Ridges, making the Tables or Pathes in the middle of the widest Intervall, and then subdivide so as the Trees may fall in the middle of the Beds, or Bordures. If for Corn-land, the tidg must be between each row, plowed within fower foot on each side the rowes or ranges of Trees; which eight foot Bordures must be derved each spring; or if stiff clay, at both equinoxes, and no vegitable suffered to grow thereon. For a man or two with large and handsome hawes 10 Inches broad, will quickly go through them in Summer, and cut the weeds at their first peeping: this would certainly be a great Improvement; and whither you apply to Corn or Grass, Fruit or Forrest-trees, I would advise you to keep them thus clean of weeds, and if ever you repent it, blame me.

9. A sixth way of planting Trees is, to make all the walkes or Intervalls open from the House proportionally, so as when you stand

stand at the House, the walkes may appear all of an equal breadth to the eye, this would suit well with my contrivance of the House, being like the Sun sending forth his beams.

10. The distance of Trees in Thickets and Orchards, is either according to the quality of the ground, Trees to be planted, or methode of planting.

If a good and deep soil, there Trees will live long and grow great and requires a large distance: Apples planted the 1<sup>st</sup>, 2<sup>d</sup>, and 3<sup>d</sup>, way may be from 8 to 10 Ells distance: Pears so planted at 10 or 12 Ells, and of these planted the 4<sup>th</sup> way may be at the least distance mentioned, because they will stand near the greatest when every second is removed; but if planted the 5<sup>th</sup> way they may be from 16 to 20 Ells one way, and from 8 to 10 the other: Cherries and Plumes from 5 to 7 Ells being planted the 1<sup>st</sup>, 2<sup>d</sup>, 3<sup>d</sup>, or 4<sup>th</sup> way; as for the distance of dwarfs and Wall-trees, see the next Chap. Sect. 5.

At the Pears distance plant Oak, Elm, Ash, Plan, Beach, Wallnut, Chesnut; at the Apples distance plant Geens, Service, Lines, Poplars; at the distance of Plum and Cherrie plant Maple, Hornbeam, Hassell, Birch, Laburnum, Aspen, Alder, Willowes, Pin, Firr, Yew. And see the last Chap. Sect. 7. for more directions.

If the ground be level, plant such Trees as grow lowest, at the South-side, and still higher by degrees towards the North, that the tallest and strongest may be on the North-side; so shall the Northern blasts be guarded off, and the Sun-beames the better received in amongst them. If the ground be not level, plant such as grow low, on the highest ground, and the contrary. And set alwayes the crooked or leaning side, towards the Southwest; whence comes the greatest winds, which in few years will make them the more erect: for you may see that all Trees that are not well sheltered from these Westerly winds, leans or declines therefrom.

When the ground is all marked out with stakes, put on the rounding string, and make the holes. See the last Chap. Sect. 7.

not to make them less than 6 foot Diameter for ordinary Trees, and you may suffer the outter row of stakes to stand, till you plant the rest that you may view thereby.

How to order the ground, and plant, see the second part of this Book; and for Inclosures see the same second part, Chap. 4.

## CHAP. V.

### *How to make the Kitchen Garden.*

THE Kitchen-Garden is the best of all Gardens, but to returne. In all Gardens it is ordinary first to make a Bordure at the Wall. Secondly a walke. And thirdly a Bordure on the other side thereof; here, the walke with a Bordure on each side of it, going round the whole plot, Parallel to the Wall: but if your ground be large enough, I bid you make a distance Intercept betwixt the walk and the Wall. Its also ordinary to divide the Garden into four plots, by two walkes crossing from side to side: but I am not for any crosse walkes in Gardens; yet if you would have more than one, (which divides the whole into two parts) then make them all one way through the plot leading to the House, and equidistant from the middle, still making the gates, doors or entries Front the walkes.

In your Kitchen-plots, & in Nurseries for Trees, plant no Trees through the ground: for when they grow up, they cover and choak the ground so, that you will be necessitate to seek for another. Therefore, make only three Bordures next and Parallel to the walkes round on each hand: plant the first or that next the walke on both sides, with a holly Hedg, the second with Goosberries and currans, the third with dwarf Trees, the ground all open and void within for Kitchen-herbes and Roots; which must be orderly divi-

divided into ridges; and these again divided into Beds, Furrowes, and Drills for your more orderly and convenient planing and sowing. As for the proportion note that.

2. The walkes must be in breadth according to their length *viz.* 1000 foot long, 30 foot broad, 500 foot long, 20 foot broad, 250 in length, 15 in breadth, 100 foot long, 10 foot broad.

The Bordures 6 foot broad, the Tables or Pathes betwixt the Bordures 2 foot broad, and these betwixt the level-Ridges (where in the ground is divided) 3 foot broad, the Beds 6 foot broad with foot and half furrowes; you may make 7 of them Beds in each Ridg, and the whole length of the plot all Running from the House: but if your ground be small you may make your Bordures and Beds narrower, yet still let the whole plot, Ridges, Bordures, and Beds be equally divided, and their Areas or Edges three Inches higher than the furrows or pathes, and so much higher than the side of walkes, as the middle of the walk is higher than its sides, all hand-somely clapt up with the Rakehead, by a line: (and the like order you may observe in your seminaries and Nurseries of Trees) then plant and sow by lines and Drills, both for beauty and conveniency.

When you would do this, divide the Bed, Bordure or Ridg at both ends into so many equal parts: (by help of the long Rule and small sticks) then stretch on the line from end to end by these sticks, and with the corner of the Rule make a mark by the line, and therein set your Herbes and Plants; and for setting of seeds, measure out, and stretch on the line as before, and with the setting stick make the holes by the line (not too deep) and therein put the seeds. And if you sow in drills, make a scratch or little eb gutter with the point of the stick by the line, and therein sow. If the rows be two foot distance, let the first be one foot within the edge; if 6 Inches sundry make them 3 Inches off the edge, and so proportionally. Note, that I have told the distances of each sort Kitchen-herbes and Fruits part 2. Chap. 6, where is intended 6 foot broad beds, but where they are less, there must be fewer rows.

3. The Kitchen Garden may be placed, its half on each side the House and Courts, and when you plant or sow, place every species by themselves (except such mixture as is mentioned part 2. Chap. 1. Sect. 3.) and where you have not a whole Ridge or at least a bed of a kind, you may compleat them with such as are nearest of growth and continuance: also plant them of long last, and them that must be yearly renewed severally, each in Ridges or beds by themselves orderly; the order is to make every sort oppose it self. Example if you plant a Ridge of Artichocks on the one hand, plant another at the same place on the other: and still where you have perennials on the one side, set the same sort at the same place on the other; and so of Annualls. In short, what ever you have on the one side, you should have the same in every circumstance on the other. Perennials are such plants as continues many years in the ground, Annualls are such as usually dy immediatly after once they bear seed, and that is usually (tho not universally) the first or second year.

4. As for physical plot you may have them in that ridge of the Kitchen Garden next the Bordures: and if you will to have no other pleasure Garden, you may have Flowers there, and on the Bordures next the walkes also: and that ridge or Intervall betwixt the walke and Wall will be excellent for all early, rare and tender plants. You may fill your Physick Herbes in Tribes and Kindreds, planting every Tribe by themselves, and you may also place one of each kind in the Alphabetical order.

5. How to order hedges, see part 2. Chap. 4. as for Walls, Brick is best, next is Stone and Lime; 4 Ells is low enough, 5 or 6 if you please: but if you would make the South-looking Wall semicircles in it, that would conduce much to the advantage of the Fruit, as well as Hot-beds under it; The distance of Wall-trees will Informe you what quantity to make them, as for example 15 foot is the distance of Cherries and Plumes, (except such as the *May* cherrie which being Dwarfish requires less) 18 foot for Apricocks & Peaches, 20 foot for Apples, 24 for Pears. Therefore if you make



make the semicircumference 18 foot for Apricocks and Peaches, (you may plant two Dwarf Cherries therein) then 36 is the whole Periphery, and as 22 is to 7 : so is 36 the Periphery to 11; here the Diameter; and having the Diameter you may easily make any part of the Circle : and let the plain or straight Wall betwixt each semicircle be just one Trees distance likeways.

And also in straight Walls divide equally, and plant non in the Corners, measure first off 6 foot on each side the gates or doors for Honisuckles, Jasmynes, &c. And whatever be the distance of your Trees, set them half therefrom, as also from the Corners, except where you make all their heads ply one way, (as on a low Wall) such may stand three foot off the Corners, or Honisuckles they lean from, and a whole distance off these they lean towards. You may plant a Goosberrie and currant in the intervalls of your Wall-trees while young, & when the Trees approach, remove them. Let the Roots of your Wall-trees stand near a foot from the Wall with their heads inclining towards the same. Wall-trees in Orchards (whose Standards are in the Quincunx) should stand opposite to the mid intervall of the Standards.

The distance of Dwarf Standards is 16 foot where there is but one row, and in following this Rule of the three Bordures, they will stand just 16 foot off the Hedge, observing to plant in the middle of the Bordures. The distance of Goosberries and currants 6 foot. But in all your plantings and sowings divide the ground so as each kind may stand & grow equally.

To conclude, these three Bordures going round at each side of the walkes handsomely made up and planted, as aforesaid, will secure the ground within from hurtful winds and colds, and make people keep the walkes (handsome pale doors being on the entries of the Hedges) so as they may neither wrong you nor themselves. Also the Hedge, Dwarf Standards, Shrubs, and Wall-trees being all well pruned and plied, with the Bordures and walkes clean and orderly kept, will make it look like a Garden of pleasure, and hide all the Ruggedness that happeneth in Kitchen-ground by delving, dunging, turning and overturning throughout the year.

## CHAP. VI.

*How to make the pleasure-garden, &c.*

**P**leasure-Gardens useth to be divided into walkes and plots, with a Bordure round each plot, and at the corner of each, may be a holly or some such train'd up, some Pyramidal, others Spherical, the Trees and Shrubs at the Wall well plyed and prun'd, the Green thereon cut in several Figures, the walkes layed with Gravel, and the plots within with Grass, (in several places whereof may be Flower pots) the Bordures boxed, and planted with variety of Fine Flowers orderly Intermixt, Weeded, Mow'd, Rolled, and kept all clean and handfome.

Plain draughts are only in use, and most preferable; that which I esteem is plain straight Bordures and Pathes running all one way, that is, from the House with one walke parting it in the middle, leading to the House door: and if the ground be large, you may make one round by the Wall too, as the pleasure-Garden of fig. 1. Let the Bordures and Pathes be both of a breadth, (*viz.* 6 foot) box the Bordures, and plant them with Flowers, lay the pathes as well as the walkes with Gravel, plant the Walls with Fruit and Flower-bearing Trees variously.

Outter Courts hath only one Bordure at the Wall, planted with Laurels and other Greens, one Pathed or Brick-walk in the middle, leading to the middle of the House-front with a long Grass plot on each hand.

2. The Bordures of your Kischen-Garden round by the walkes may be boxed with *Thyme*, *Lavendar*, *Hyssop*, *Rue*, &c. the next with *Parfly*, *Strawberries*, *Violets*, *Juby-flowers*, &c. Cherrie-gardens and Physick-gardens with Sweet-brier often cut, or *Box* cut three times *Per annum* as *April*, *June*, *August*, minding to cut their Roots at the inside every second year, that they exhaust not the strength or nourishment of the Flowers or Herbes. But that

that which I preferre for Flower-Gardens above all, is *Dwarff-Juniper* raised from the seed and Planted thus. When the ground is levelled, measure out the Bordures, (but raise them not above the walkes, except you minde to lay gravel) stretch a line and with the edge of the Rule mark alongst thereby, and therein set the young sets of *Box* or the young Plants of *Juniper* at a years growth; then prepare the Bordures by delving in consum'd dung of Cowes and Sheep, covering on a little lime topt with a little sand, to ly all summer, kept clean from by hawing. At the beginning of winter delve and mix together, to ly all winter un-Raked, and at the Spring redelve, stir and mix it thoroughly, and train and plant your Flowers and other Plants in their seasons. See Part 2. Chap. 7.

3. In making the walkes in any Gardens, first level up the Bordures at its sides, secondly drive a Row of Stakes in the middle of the walke, and level them accordingly *i. e.* stretch a line across the walke betwixt the two level Bordures, and marke where it hits the Stake in the middle of the walke; do this at both ends, and viewing betwixt, will levell the rest, see the next Chap: of levelling. But you may mind, that the walk must rise a little in the middle, and yet the middle of the walke, and top of the Boxing of the Bordure must be level, *i. e.* The Boxings so much above the side of the walk, as the middle of the walke is above its sides. Where your Boxing is timber or Stone, fill up the bordure of Earth to the top thereof, but where your Boxing is of box-juniper or the like, the Earth within the bordure and edge of the walks and pathes without, must be equal.

As for the rise or swell that walkes has which makes them *Segmenta Circuli*, grass or brick walkes may have for 30 foot broad 6 Inches rise, for 20 foot 4 Inches, 10 foot 2 Inches; and let gravel have an Inch more proportionally: and it agrees with the rule of proportion in Arithmetick, as 20 is to 4: so is 30 to 6. If gravell or brick walkes or pathes ly by the side of grass, make the grass half Inche higher than such. If the walke be Grass, make 2 foot Tables, or pathes of gravel betwixt it and the Bordure.

4. To lay grasse, first level the ground, whither walke or plots; and its the better to ly a year so made up, before you lay the turff; because it may be levelled up again, if it sink unto holes. If it ly wet, bottome with Stones and Rubish; and if the Earth be fat, take it out, and put in sand; however lay a foot thick sand immediatly under the Turff: then by the squair streatch lines, Ritt with the Ritting Iron (which is an half round put into the end of a crooked stick) & raise the Turff with the Turff-Spade, (which is broad mouthed, otherwife all one with the Husbandmens breast-Turffing-spade) let the Turff be of equal thickness, near Inch and half thick, a foot and half broad, and as much in length, lay their green sides together, when you put them in the cart, but do not Roll them when brought home, lay them all even and clos; Feeling each particular Turff with your foot, so as you may discern any Inequality; to be helped Immediatly, in laying still, beating every two three rowes of turff while moist, with the Timber beaters, and when the the whole is layed, and well beat, Roll well with the Stone-Roller, which should be as big as a hog'shead, The Spring and Autumne is the best time. And if you mind to keep a good pile of Grasse, suffer it never to grow Inch long; beat, mow, and Roll often, especially in the mornings and moist weather.

5. But if you would lay the hard tile or brick walkes, prepare as for Grasse, minding it wants the breadth of the brick of the true height: for you must set them all on their edg clos by other on a bed of lime, laying the side, each other Row crossing the ends of the other, and place one in the middle of the walkes that both sides may be Regular.

6. To lay gravel, cleanse first the bottomes of the walkes of fat Earth, and Root weeds, and bottom it with Stones; and lay over that about half a foot of clean round gravel, and about three Inches top gravel of equal greatness which may be like beans and pease: you must make it thus equal by sifting, and so Rake, Tred, and beat; and when compleatly levelled, beat well with the Timber beaters, while moist, then Roll soundly with the Timber-Roller, and

and afterwards with the Stone-Roller, especially in Rain, for which the Spring and Autumn is best; but if dry weather, you must dash water one the Roller (continually in Rolling) with the watering pott, and if you are forced to use Sea or water sand, you may beat some good clay to dust and mix with such, before you lay it; weed, and Roll frequently.

7. For the orderly planting of flowers there may be three wayes, as first in the Bordures of pleasure Gardens or Courts, plant 5 rowes in the bordure, and Intermixe them orderly *i. e.* divide and plant every sundry sort through the whole Garden at equal distances, and not only so but every sundry colour thereof also; let never two of a kind nor two of a colour stand together, without other kinds and colours Intervening, so as there may not be two, three of a kind or Colour at one end, Bordure, Plot or Place, and non thereof through the rest, but universally and ornamentally Intermixt, and when you find a breach by some being past the flower, you may have various Annual Flowers sown in potts, ready to plunge into the vacancies of the Bordures for continuing this beauty.

Secondly, in my sort of flower Gardens which is Bordures and pathes running all one way *viz*: from the House, Plant 5 rowes and intermix them, not as in the last way, but set 5 rowes of each kind cross the Bordure, so as 25 of each sort may stand in a Geometrical squair. As if you set a squair of Tulips, a squair of Boars-ears a squair of Crocuses, a squair of July Flowers, a squair of Anemonies, and a squair of Couslips: and so a squair of Tulips, another of Boars Ears, &c: Through that Bordure Intermixing the Colours of each sort, then may you make the next Bordure so Intermixt, but differing: minding that as you Intermix the Bulbous and Fibrous in each Bordure, so must they be also in the crossing, that the squair of Fibrous in this may oppose the squair of Bulbous in the next, and likewise whatever Bordure such sorts are in, on the one side of the walke, set the very same in the Bordure equidistant from the walke on the other side, that the whole may

For order in the new wall see be

be Regular and uniformly Intermixt all the year, looking from all sides, ends or Angles.

Thridly in nurseries of Beds and Ridges, Plant every kind in thickets by themselves, and Annualls and perennials by themselves (except only that you Intermix their Coloures) that is, make a whole Bed or Ridg of each kind, 6 Rowes in the Bed, the Dwarfish may be 8 Rowes: thus every thicket of them Flowering in their own order, will have a great shew, and at a great distance; and here also observe uniformity, that is, alike on each hand, see the last Chap: sect: 3. For if you have a Ridg or Bed of *July-flowers* or the like on the one side, Plant another thereof at the same place on the other, &c.

And because Flowers must be removed some in one, two, or three years, and the Earth renewed or enriched, and properly prepared, else they degenerate; (because in long time they exhaust the substance of the ground, at least that part appropriate to them) therefore you have a good conveniency for effectuating the same by these last two models perscribed: for often you will have some Beds or squairs where your Annualls stood, to replant your Tulips, Anemones or the like unto, and so another sort where these stood, and your Annualls again where this last was; and because here you remove a whole Bed or squair of a kind at once, you may very conveniently prepare, Delve, Stir, Beat, sift and mix it thoroughly with the soyl proper (a thing most necessary) and this you could not well do, where they are scattred as in the first way. See the Rules mentioned Part 2. Chap. 1. Sect. 10. and Chap. 7.

As to Terrase walkes, if the Brow on which you make them, be not too steep, the work shall be the more Facile: if you build them up with walls, be careful to found deep enough according to the level, and if the middle of the terrase be on the Central line of the house or of any walke, make the Stayr of the upmost and downmost there to part at a plat on the head going down at both sides, so much of the stayr case may be within as that the outter edg thereof may be in a line with the Bordure at the wall, by this it marrs not the walke.



walke, the rest may be at the ends; Plant the Bordure at the upperside of the walke with wall Trees, the under side (being but ell high) with Laurels: &c. But if your Terrase consists only of walkes and sloping Banks, you may have the Bordure at the head and foot of each Bank on either side the walkes, Planted with standard cherries &c. and the Banks, of *Violets*, *Straw-Berries* or *Grass*.

9. As for Pondes make them large and broad, such being best both for the health of Fish and Fowll, Clean, and most preferrable water for watering Plants: squair, Triangle, Circle, Ovall, or what figure fits your ground best; let them be 5 or 6 foot off solid water at least, with Sluces to let it Run in and out at pleasure.

I am against Arbust and close walkes except Trees their natural closing, where we have both shade and Air.

## CHAP: 7.

### *How to Level Ground.*

I Have often wished that there might be some Rules found, whereby this expensive worke might become more easy. There be two sorts of levelling *viz*: the Horizontal, and Sloping. The first is best known, but the last more profitable and convenient. Example, I have made a plot slop 4 foot in 200 long, and 18 Inches in 380 foot the other way: this was not perspicuous to vulgar eyes, yet to have made it Horizontal, would have been Ridiculous as to time, paines and expences. And in levelling the walkes about a plot (which sloped naturally) to make them correspond with the grownd rownd, I behoved to make the middle walk agree with the side ones whereupon it slopes 10 foot in 370 long: now if I had made this Horizontal, it would have been 5 foot or 10 steps lower than the one side walke, and as much higher than the other, and so worse and more Inconvenient than before, both as it is a walke,

and anent Correspondancy with the rest of the ground within; therefore I am for levelling any ground sloping, that it may turn a little to the Sun if possible, for drawing water, that it may correspond with its adjuncts, and above all to prevent the more costly way: for Its certainly a principal observation in levelling, not only to cause, the ground of it self serve it self, but also to level it as it lyes most conveniently, which is the cheap and easie way of levelling. When you have a Row of stakes set in a straight line and about 20 foot distance, as in the edge of a Bordure or middle of a walke, the way of levelling them either Horizontal or sloping, is to mark and put a nail in the two Stakes which are at the extrems or ends thereof, and view betwixt, cause marke all the Rest which are betwixt, in a level line, therewith; This is the easiest, the exactest and quickest way: and in the same methode you may go round any plot, and consequently crosse (every way) the same accordingly.

In that which you would have Horizontal, place the long Rule and the level at one end, suppose the sole of the Door, till the plumb fall right in recovering, and view alongst the said Rule (as on a fowling piece) that you may see what part of each Stake it hits, and cause one with a piece white paper or white hefted knife hold the same at each stake, its heft tending out (as the nails which carry up the line) and direct him by words or signes to hold up or down till it be Just level: when they are all marked, measure down so much on each Stake, as was raised up for conveniency; in viewing there marke, put in nailes a little, stretch on the line, and level up the earth or gravel thereunto.

And where you would have determin'd slops, set on the level and marke the far-end stake in a level line therewith, then measure down upon the said Stake or pole from the marked place so much as you designe the slope, and put in a naile with white paper about it, and at the upper side of the Rule in the stake at the door, put in another nail, and by viewing betwixt these two, marke all the rest as before. If the distance betwixt the extrems be farr where the sight may dazle, let the viewet descent his station, and come foreward at every

every 5 or 6 Stakes and holding his knife at the last marked Stake, cause his assistant or stake-marker proceed.

To level as the ground lyes, let its slope be what it will you need neither level nor Rule (except you please to try how much it slopes after its done for satisfaction) only set stakes as before, and viewing the ground narrowly put nails in the stakes which are at the extreames where you think the ground will Run when levelled to make it serve it self, and as it lyes best or easiest for levelling: and when you have concluded upon the level at the extreames, make all the stakes in the Intervall by viewing as above.

2. But to proportion the level to the ground is the whole art of levelling. Its true it is easie, if you have a plot or walke a foot higher at one end, to take half a foot thereof, and lay on the low end so as the two ends may be Horizontal, (I have already shew'd how to level having the two ends found) or if it be Horizontal to take 9 Inches off the one end, and lay on the other, that it may slope 18 Inches: but if some places of it ly one way, and some another, and some neither the one nor the other, this increaseth the difficulty. Wherefore you must first drive stakes at the corners of the plot, then view the ground about and put nayles in the stakes where you would have the level Run, or at least where you think by your eye it may most conveniently come to make it contain it self, and easiest to be levelled: also set up several stakes in the Intervalls and Cross-ways through the plot from opposite Angles, and by viewing betwixt the foresaid nailes every way marke all the stakes level; but if you cannot see from the markes of this supposed level which are on these corner stakes, seeing there may be some underneath the ground, little Hills, or some such obstructions in the way, then measure equally up upon each of them, so far as you think convenient for getting your sight, and mind to take down the same again after viewing.

When all is marked with this supposed level, go over and note narrowly how it will agree, that so as your reason shall teach you to alter, take up one end or down the other, or up or down both till

you bring it to such proportion, as to do its own business it self. Or you may do more exactly thus.

Suppose you have a Bordure or middle of a walke with sixteen stakes driven therein at 20 foot distance, all marked with a supposed level, and 10 of their marks above ground, and 6 under ground: first measure how farr the marks on each of the 10 stakes is above ground, and write them down particularly, and adding their measures together, you find 13 foot 4 Inches. Secondly measure how farr the marks of the 6 stakes are under ground, & write down, adding them together you find it 12 foot; subtract the one from the other and the difference is 16 Inches which must be divided by 16 the stakes in the Bordure, that is, an Inch to each stake, so that this supposed level is an Inch higher over all than the true level, which being taken down will make the ground there level it self, and no more. This may suffice for example, but I could say more, if I did see your ground. And if you can thus proportion the level to one Bordure, walke, or one Row of stakes, you may by the same Rule find the level for the stakes round and cross the plot, and consequently level the same accordingly: for having once concluded on the level, drive stakes over all the plot as in my first way of planting Trees, (see Chap. 4. Sect. 4.) and make and put nailes therein as above is taught for carrying the line. Except you mean to follow my method of levelling the Kitchen-Garden, or the like for planting and sowing, which is only to level one Bordure thus by stakes and lines. Round each plot and by the eye level up the ground within thereunto all along in Trenching, albeit this not so proper for Courts and Grasse plots. However as by this means, I use to level ground without a level, so do I think this way of finding out the true level by means of a supposed one, worthy your notice, and if rightly improved save you much money and paines.

Be cautious in founding your Walls lest you undermine them in levelling, nor is it convenient sometimes to confine your level to the foundation of Walls already built: for in so doing, you may lose more, than would cast down and rebuild, but in such cases you may rather build under gradually.

3. There

3. There be some bad lying plots and walkes, with an ascent at the head, hollow in the middle, level at the foot, these and the like are very troublesome to level under one denomination: for the taking down the Hill, bares it so, that plants cannot prosper thereon. some are necessitate to take out the Gravel, Tile, or Stones so much deeper, and travell earth again: but I rather advise to make terrases; you need not confine to the number of banks, but only to the proportion and uniformity. If it tend all one way as high at one end and low at the other, then its proper enough for perpendicular walkes that front the house, but if low in the middle and high at both ends, or low at both ends and high in the middle, then more proper for Parallel walkes, (whose extremities are equidistant from the central line of the House) remember to divide and slop them equally.

This minds me of some abuses, which I have seen, as a plot of sloping levelled ground, with another Horizontally levelled lying at the foot thereof, (at least not under one slop) or Horizontal walkes and bordures lying by the foot and head of sloping plots; these are unseemly: for you should allwayes make them slop under the same denomination (except in steep and high banks) I have made walkes of 18 foot broad slop 18 Inches from one side to the other, because the whole plot sloped the same way, so much proportionally, yet to the eye appears very pleasant; but where such Horizontal and sloping pieces ly contiguous, the defect is easily seen, therefore if you be necessitate to lay some plots so, (albeit I know reason for laying walkes so) make rather a Hedge to Intercept, and in all your workes let there be a connexion.

4. There be some more obstructions in levelling, as in a long walke when you have the two ends found and marked, (either with a supposed or true level) and cannot see betwixt, to do it exactly by reason of length: here two may go to the middle or near it, where you may conveniently see both ends, looking back and fore, there drive in two stakes near the length of the long straight Rules distance, at which hold on the Rule; and let one view along the same till the marke at the West-end be level therewith, and the other

other towards the East till the marke there be also level with the same; so both may alter up or down till they have their desires at once: then fix the Rule, and having as many stakes set as is needfull, you may view backfight and foresight hereon, and level them all exactly,

5. But if a Wall, a House, &c. Intercept, measure perpendicular and exactly up to the top thereof, and on the other side measure down the same again; and so set forward the level, but so as it may communicate with the rest, when obstructions are removed.

But if a Hill, go to the Top, set the Rule level, and laying an eye thereto, cause one with a long pole go down till its Top be level therewith (he holding it level by a Plumb Rule) then descent your stations and set the upper-end of the Rule where the pole stood, there level it and do as before: thus from station to station to the foot of the Hill, (if it be so great) keeping compt in a Note-book what poles and parts; the which may be as easily taken down the other side by the same method.

But if it be possible to see over the obstruction on 3 footed standing leathers by help of long poles or Pikes, (as I have done in the like case) raise your level thereon, and having viewed, and marked that on the other side, measure down the same there, &c.

6. I might here speak of the solidity of earth, whereby you may move readily compt the expence of levelling, but having shew'd in the next Chap. Sect. 5. How to measure solids, I presume its applicable to earth: (as well as Timber, Stone, &c.) For if you know the breadth, length, and deepth thereof, you may find how many solid Ells, &c. And if you know how many Ells and parts will load a cart and how many carts a day, you may go near to calculate the cost of the whole.

7. In levelling any ground for Kitchen ground, Orchards, or Nurseries, take not away its good earth or surface, (as you bring down the heights) but alwayes turn over the upper-part thereof behind you, carrying away that which is below, so much deeper, that it may contain that surface, and put the bad earth in bottom of hollowes with better mould above it.

In



In the practise of levelling (or other workes) contrive the working, so as there may be still a motion amongst all the partes; and albeit carts are cheaper for levelling than Wheell-bartowes, if the way of carriage be not very short, yet if you do not set as many men to fill the carts as may have the one full against the other come in and no more, you lose considerably: and this will be according to the distance of carriage, or as the earth is capable of being wrought; and so with Wheell-barrowes for two Wheelers, three barrowes, and one filler sometimes doth well, sometimes more fillers or fewer Wheelers, yet still let them have a led barrow. And if this could be done with carts also, it would be of great Advantage. wherefore in my opinion there is no way so probable to worke this effect, as the carts with three Wheelles where by 2. men, with 2. of them carts, and one Horse can do as much as three Men, two Horses, and 2 Carts: for one man to fill the led Cart, the other Man to drive the one Horse: and when he comes in, he has nothing to do but take the Trafes and Hooks off the empty Cart and put upon the rings of the full one and so drive on. This Cart has no Trams or Limbers, but a Swingle-Tree or Breast-board before, where the rings that keeps the Traffes are: it has a handsome folding body, the thrid Wheell is about 30 Inehes Diameter all Iron and Runs in a Shiers of the same fastned perpendicular under the middle of the forebreast with a turning Pin of Iron; the other two Wheelles are common, but if they have an Iron Axis, the better.

8. To bring in Water in Pipes to your Houses, Courts, Gardens, Pondes, Parks, &c. Consider on the level, for as the place where you convey it unto, must allwayes be lower than the Fountain from whence it comes, else thither it cannot flow: so must you take notice that no Hill in the way of its conveyance be so high as the Fountain it self. You may find the level by placing your instrument at the Well or Fountain, as I directed in walkes. and if a Hill intercept that sight, plant on the Top thereof, that by back-sight and foresight you may find the difference: that hence you may know whither you can carry it about the obstruction: but if

the distance be farr, you need to be the more exact. As for Instrument, the Crofs discribed Chap. 3. whose sights may be two Prospect Glasses, may do well whither for one or many stations. Let one stand at the Spring-head, another betwixt and the place whereunto you desire to carry the Water, a large distance sundry, but so as a thrid man about the midle may see both their Marke-boards that is on their Pikstaves, and direct them to hold level by his back and foresight, desiring them to keep accompt what foot and parts: and so come foreward till the assistant at the well plant where the foremost stood, and thus proceed all in a straight line, and do as before, from station to station so long as needfull. at length add all the measures of back-stations together, and all of the fore-stations: substra<sup>c</sup>t the one from the other, and the remainders gives the difference of levels betwixt the Fountain and the appointed place.

Allow to the fall of the Water for every 1000 foot in length 12 Inches slop at least.

---

## CHAP. VIII.

*How to measure, divide and lay out Land, &c.*

Some following other-Countrey-books Ignorantly measures our Ground with their measures, therefore I am here to Informe such thar,

In measuring all figures whither superficial or solide, it is requir to know first, wherewith they should be measured, secondly how they should be measured.

Land is done by ell, or fall measure, (also Masons Roughwork-buildings) Stone, Board, and Glafs by foot measure: 12 Inches a foot (and no distinction betwixt a Scots and English foot) the Glaziers

ziers used only 8 Inches, but the Act of Parliament hath reduced them to 12 as others. Some would think 12 Inches but a thrid part more, whereas it is equivalent to  $2\frac{1}{3}$  of theirs: for 8 times 8 is 64, and 12 times 12 is 144, out of which I get 2 times 64, and the 16 remaining is  $\frac{1}{3}$  thereof. This minds me of that question *viz.* Whither is a squair half foot or half a foot squair most? I have heard severalls say they were both alike, but this was their mistake: For a half foot squair (superficial,) is but the half of a squair half foot, and it solid its but  $\frac{1}{3}$  thereof.

The Scots Ell according to several Acts of Parliament is three foot one Inch, or 37 Inches long: 6 ells long and 6 ells broad is 36, a fall squair: 10 falls in length and 4 in breadth is 40, a Rood squair: 40 falls in length and 4 in breadth is 160, an Acre. See the Table of superficial squair measure. And these that desires long measure, 6 ells long is a fall, 40 falls a furlong, 8 furlongs a mile. See the Table.

*ATable of Superficial squair  
measure, according to  
Scotland.*

|       |    |      |      |
|-------|----|------|------|
| Acres | 4  | 160  | 5760 |
| Roods | 40 | 1440 |      |
| Falls | 36 |      |      |
| Ells  |    |      |      |

*ATable of Superficial long  
measure, according to  
Scotland.*

|      |       |          |      |
|------|-------|----------|------|
| Ells |       |          |      |
| 6    | Falls |          |      |
| 240  | 40    | furlongs |      |
| 1920 | 320   | 8        | Mile |

We differ in measuring land from the English, as the fall differs from the pole: our fall is 6 ells or  $18\frac{1}{2}$  foot, their pole is  $5\frac{1}{2}$  yardes or  $16\frac{1}{2}$  foot.

By what is said I hope you know wherewith to measure, it only remains then that you know how to measure; of which anon.

2. In measuring all superficies we take notice of the breadth and length, but of solides the breadth, length and deept. To instance in a few, and first of some Superficial Figures; as a Geometrical squair, (see fig 18.) it is measured by multiplying one side in it self (*viz.* *a. b.* or *e. e.* or *a. c.* or *b. c.*) which here is  $30\frac{1}{2}$  falls: In your workings I would advise you to make use of decimal Arithmetick, because thereby you may work whole Numbers and Fractions together with great ease and quickness, and you may reduce ordinary Fractions into decimalls, by multiplying the Numerator by 100. or 1000. &c. and dividing the product by the Denominator, so shall the  $\frac{1}{4}$  of any thing be 25, the  $\frac{1}{5}$  5, and the  $\frac{1}{7}$  75: therefore

multiply  $30.5$  in its self, the product is  $930.25$ . which is  $30.5$   $930.$  falls and  $\frac{1}{4}$  of a fall. See the example, for when you multiply decimally what ever fractions are in multiplicand and multiplicator, cut them off after addition: the which if there be any will be Fractions, as here you see

|         |
|---------|
| $30.5$  |
| $30.5$  |
| $1525$  |
| $9150$  |
| $93025$ |

two cut off *viz.* 25 which is  $\frac{1}{4}$  of 100, the fall being here into 100 parts the Integer of 25. And when you divide decimally, as whole Numbers and Fractions by whole Numbers, put still a dash betwixt the whole and Fraction, and notice how often you will get your divisor placed under the whole Numbers of your dividend, and just so many whole Numbers will be in the quotient and the rest Fraction: or if you divide whole and Fractions by whole and Fractions, notice how many times you may place the whole Numbers of divisor under whole Numbers of dividend &c. Or if you divide whole Numbers by whole and Fractions, whatever Fractions be in divisor add so many Ciphers to the dividend, and do as before.

You may reduce this (or any other) plot into Acres by dividing by

by 160 the falls in one Acre, and the product here will be 5 Acres  
 130 falls and  $\frac{1}{4}$  of a fall. But if  
 you would further know what this  
 Fraction (25) is in Ells, say, if 100  
 be equall to 36 the ells in one fall  
 what is 25 equall unto? Multiply  
 the 2d Number by the 3d, and di-  
 vide by the first and the answer will be 9 ells. See it wrought.

|        |     |        |
|--------|-----|--------|
| 900    | 36  | 1      |
| 100 (9 | 25  | 43     |
|        | 180 | 930 (5 |
|        | 72  | 160    |
|        | 900 |        |

Moreover falls may be reduced into poles, and poles into falls, or *Scots* measure into *English* or *English* into *Scots*: one superficies is to another as the squairs of their like sides, therefore as the squair of 16.5 (the *English*) is to the squair of 18.5 (the *Scots*) so is the content in *Scots* Acres or falls, to the content in *English* Acres or poles.

Example the squair of 16.5 (*i. e.* 16.5 multiplyed in it self) is 272.25 and the squair of 18.5 is 342.25, And as 272.25 is to 342.25: so is 930.25 (the content of the said plot in falls or *Scots* measure) to 1169.43 $\frac{1}{4}$  fere, its content in poles or *English* measure. This I thought fit to mention, to let any see that knows not the difference betwixt the *English* measure and ours.

Secondly an oblong squair or Parallelogram (see fig. 19.) by multiplying the breadth by the length: *a. d.* or *b. c.* is its length and *a. b.* or *d. c.* its breadth.

Thridly, a Triangle, (see fig. 20.) all Triangles are measured by multiplying the whole base by half the perpendicular or whole perpend: by half the base; *a. b.* is base and *i. c.* the perpendicular, or without the perpendicular at all, add up all the sides, and take half the summe; from this half summe take every side, which call the three differences, multiply these three differences and the half summe continually together, the squair Root of the last product shall be the Area of the Triangle.

Fourthly, a Trapezia (see fig. 21.) is reduced into two Triangles, and measured accordingly.

Fifthly, and so is any irregular straight lined figure, and if any side of it be crooked, draw a line that may leave out as much as it takes in. But if it cannot be measured within because of obstructions,

then add on the outside till you reduce it into a squair, and after multiplication substract what was added, the remainder shall be its Area.

Sixthly a circle (See Fig: 22.) is near equall to a squair made of  $\frac{1}{2}$  the diameter and  $\frac{1}{2}$  the circumference or periphery, and therefore is measured by multiplying *a. g. c. o. b.* the Semicircumference by *a. d.* or *d. c.* the semidiameter. And having any one given you may find the other by the Rule of proportion thus:

The lowest number is, as 7. is to 22: so is the diameter to the Circumference, or as 22. is to 7: so the Circumference to the diameter, or thus: As 1. is to 3. 1416: so the Diameter to the Circum: or as 3. 1416. is to 1: so the Circum: to the diam: or as 113. to 355: so diam: to periphery, or as 355. to 113: so periphery to diameter.

In this the Diameter is 63 falls and as 7. is to 22: so 63 (the diam:) to 198 (the periphery) Take  $\frac{1}{2}$  periphery which is 99. and multiply by  $\frac{1}{2}$ : Diameter which is 31. 5. and the product is 3118. 5. or as 28. is to 22: or 14. to 11: or 1. to 785399: so is the squair of the Diameter to the Area of the circle: or as 22. to 28: or 11. to 14: or 355. to 452: or 1. to 1. 273239: so is the Area of the Circle to the squair of its diameter. as 1. is to 282095: so is the circle to the Root of a squair equall to the Area of the circle. as 1. is to 707107: so is the Diameter to the Root of a squair to be inscribed in a Circle. as 1. is to 225072: so is the periphery to the Root of the inscribed squair in the circle, and as 1. is to 886227: so is the Diameter to the Root of a squair equall to the Circle, which is the squaring of a Circle.

Seventhly, the Semicircle is measured by multiplying the Radius or semidiameter by  $\frac{1}{2}$  of the circumference of the whole Circle.

Eighthly, the Quadrant or  $\frac{1}{4}$  of the Circle, by multiplying the Radius by  $\frac{1}{4}$  of that Arch line which is  $\frac{1}{4}$  of the periphery.

Ninthly, to measure the segment of a Circle as *g. i. o. c.* first draw its Radius from *d.* to *o.* which constituts the Sector *d. o. c.* And as the Quadrant hath 90 degrees so this Sector hath 40: therefore say,

as



as 90. is to the content of the Quadrant: so is 40. to the content of the sector, the Triangle  $d. o. i$ . Being substracted from the Sectors content, Rests half the segment, that doubled is the Area of the whole.

To do Geometrically, find the length of its Arch line thus: (See Fig. 23.) divide the chord line  $a. d. c$ . Of that arch into 4 equall parts set one of these from  $c$ . to  $i$ . on the chord line, and one of them from the Angle at  $a$ . to  $o$ . In the Arch line, then draw the line  $o. i$ . which line is half the length of the Arch line,  $a. o. b. c$ . (but if the part of a Circle be greater than a semicircle, then divide the Arch line into two equall parts and find the length of one of these as is taught, which doubled is the half length of the whole.) here take the half of the Arch line of Fig: 23. And multiply by its Radius  $e. b$ . The product is the Area of the segment  $b. c. d$ . and the Triangle  $a. c. e$ . which Triangle must be substracted therefrom, and the remainder is the Area of the segment.

Tenthly, if you would measure the oval, then observe the Rules in measuring the segment: seing the oval is made of segments; If it be from two Centers, then its but two Segments, If from four, then it is four segments and a quadrangle.

Eleventhly Regular poligons are such figures as consist of equall sides and Angles, and which may be inscribed in a Circle or Circumscribed about a Circle, whither pentagon 5 sided, hexagon six sided, Heptagon, Octagon, Nonagon, Decagon, Dodecagon, for any of these take half the compass about and the perpend: drawn from the Centre to the middle of one of the sides, multiply the one by the other, and that gives the content.

Twelvthly to measure any Irregular figure consisting of straight and Circular lines, the arches and angles bending Inwards; If you cannot reduce them into some of the Figures above mentioned within it self, you may do it by drawing lines without: and after you have multiplied, substract what was added (whither segments or others) and there will remain the Area of the figure proposed.

Mountrains and Valleys are best reduced into Triangles, and so mea-

measured: for albeit they make rather spherical than plain Triangles, yet the way of mensuration differs not; yet as in plain Trapezias there are other wayes than by Triangles (as taking the half of both ends and sides added for the mean breadth and length) so for mounts and Valleyes, *viz*: Measure the circuite or base part of the Mountain and its top, add them together, and take half of that sum for the length; do so with the ascense (or going up from foot to top) of 2 sides of the Hill, add the measure of the longest and shortest side together, taking the half thereof for the breadth, and multiply the one by the other, that gives the superficies of the Mount or Hill.

And as you measured the compass of the foot of the Hill so must you round the circuite or compass of the hight of the valley or glen: and as you measured the top of the Mountain, so must you the bottom of the depth of the valley; add them together and take half thereof for the breadth. likewise as you measured the ascense of both sides of the Hill, so must you the descense or going down of both sides to the bottom of the valley; add them together, and take half for the length, and so multiply as before.

3. Albeit I have said enough of measuring land, yet there is much more required in dividing and laying out the same.

The first time I saw the need of it, was in making an Avenue of great length which crossed a march several times, which did take in several pieces of land and cast out others, but non of them being equal neither in shape nor proportion, I behoved to measure both, and then cut off so much as might Ballance, and that from parts assigned.

As first, if from the Triangle *a. b. c.* (being Fig: 24.) which contains 870 falls squair, you would cut off 300 falls squair, then finding the base *c. b.* of this Triangle to be 58 falls long, say, if 870 falls (the whole plot) have 58 for its base: what will 300 (the part I desire off) have for its base.

Answer

Answer, 20, therefore measure  
alongst 20 falls on the base from  
one end thereof, as from *b.* to *d.*  
then draw the line *a.d.* so shall  
*a.b.d.* contain 300 falls, and *a.*  
*d.c.* 570. Or

|           |  |             |
|-----------|--|-------------|
|           |  | 300         |
| I         |  | <u>58</u>   |
| 17400 (20 |  | 2400        |
| 8770      |  | <u>1500</u> |
| 8         |  | 17400       |

If it be required to take off part from a Triangle, according to any proportion given, by a line drawn parallel to any of the sides assigned, as let *a b.c.* (which is Fig. 25.) be a Triangle containing 7 Acres, or 1120 falls; and it is desired that 2 Acres be cut off by a line drawn Parallel to *a.c.* Its base line is 57 falls which you must divide in proportion, as 5. is to 2. in the point *d.* then seek the mean proportional between *b.d.* 42. and *b.c.* 57. as *b.f.* 48  $\frac{1}{2}$ . But having (as in the end of this Chap.) shewed how to find mean proportionals Arithmetically, I shall here shew you how to do Geometrically.

Therefore describe the semicircle *b.e.c.* and at the point *d.* on the base line, raise the Perpendicular *d.e.* Cutting the Arch line in *e.* then set the length of *b.e.* (which is the mean Proportional) from *b.* on the Diameter line, and that will reach to the point *f.* now from the point at *f.* take the nearest distance to the line *c.a.* and set that distance squair off at *a.* to *G.* then draw the line *G.f.* exactly parallel to *a.c.* so will the Triangle *G.b.f.* be 5 Acres, and *G.f.c.a.* 2 Acres, the thing propounded.

If you would cut off some part from a squair parallel to one side, you need only measure that side, whence you designe to take it at, and divide the parts, you ar to take off thereby: and the quotient shall tell how much you must set off. Example by fig: 19. its an oblong squair denominated *a.b.c.d.* I desire 3 Acres or 480 falls, cut off at, and parallel to the side *a.b.* which side is 32 falls, divide 480 (the part you ar to cut off) by 32 (the side of the squair) and the quotient will be 15 therefore set off 15 falls from *a.* to *e.* and from *b.* to *f.* and the squair *a.b.f.e.* is 3 Acres, as was required.

But if its sides did not go squair off, as the Trapezia 21. then reduce the Trapezia into a Triangle, and divide the base into so many  
H equal

equal or unequal parts, (as you would have the Trapezia into) then find a mean proportion between the extreame points of the base, and every particular point in the base: from which means draw lines through the Trapezia parallel to the side assigned, which may answer your requiring. Or

A more ready way to work on ground, is to find the mid line of the ground you are to cut off, and divide thereby, &c. But the question, is how to effect this, you may first set off the whole in two Triangles, viz: If you would cut off 160 falls, at the end *a. b.* of fig: 21. Then set off the half thereof at the Angle *c. a. b.* to cut the line *a. c.* by the first: for you will find that as the Triangle *c. a. b.* contains 364 falls, so must you go  $7\frac{2}{3}$  from *a.* to *e.* on that base, to draw the line *b. e.* that Cuts off the Triangle *a. b. e.* containing 80 falls. Likewises as the Triangle *d. e. b.* contains 165  $\frac{1}{2}$ , so must you go from *b.* to *f.* that, *a. b. e. f.* may containe 160 falls. Only the line *e. f.* is not parallel to *a. b.* therefore as *b. f.* is 5 longer than *a. e.* set 2  $\frac{1}{2}$  out from *e.* to *G.* and in from *f.* to *b.* and draw the line *G. b.* parallel to *a. b.* and to leave as much out as it takes in; then find the length of the mid line betwixt *a. b.* and *G. b.* viz. *i. k.* which is 16. and by the same divide 160. the quotient shall be 10. And that will reach from *a.* to *G.* and from *b.* to *b.* so as to cut off 160 falls at, and parallel to the end *a. b.* (by the line *G. b.*) as was desired.

It is required to part the pentagon or fig: 26. Into two equal parts from the Angle at *a.* The whole figure is 10 Acres, one Rood and 12 falls, that is, 1652 falls; then the half is 826. and the Triangle *a. b. c.* is but 441. which wants 385 of the half: therefore take 385 from the Triangle *a. c. d.* by the first Rule, and there will be added the Triangle *a. c. f.* to the Triangle *a. b. c.* which will divide the figure into two equal parts, the thing required.

I am desired to set off a third part of the hexagon or fig: 27. By a line drawn from the point *G.* the whole plot is 45 Acres and 145 falls or 7345 falls, the  $\frac{1}{3}$  thereof is 2448. and the Trapezia *G. e. f. a.* is but 2041. 875. which wants 407 falls: (and the fraction which a little more than  $\frac{1}{3}$  of a fall) wherefore I must take 407. 875 from the

Tr

the Triangle *G.d.e.* by the first, thus. If 2523.50 the content of the Triangle *G.d.e.* have for its base *c.d.* 62 falls, how far must I go on the same to get off 407.875? answer, 10  $\frac{3325}{25235}$  that is 10 falls and about  $\frac{2}{3}$  of a fall; the which being set from *e.* to *h.* to draw the line *G.h.* parts off the  $\frac{2}{3}$  of this Irregular hexagon, as was desired.

If you were desired to lay out any number of Acres at pleasure into a Geometrical squair, you need only reduce them into falls and extract the squair Root thereof (as at the end of this Chap.) which is the length of one side, and so measure, or set off by a Chain. Or

If you would have it ly in a Parallelogram or oblong squair, you may lay it out, as I directed for cutting off some part from a squair parallel to one side: for knowing how many falls you would have into the oblong squair, you may make a side at pleasure (if not already confin'd to one) and divide thereby as is taught. Or

If you would make a Triangle to contain so many Acres, Roods, or falls, double the number of falls, then take for the base of your Triangle, any number at pleasure, by which divide the double of falls to be brought in the Triangle; and the quotient shall be the perpendicular to that Triangle, whose content shall be the number of falls proposed. And herein consists the Reduction of figures Arithmetical.

4. Perhaps you may have occasion, to measure the solidity of Earth, Timber Trees, Stones, &c. Now to find the superficies of solids, as,

First the Sphere or Globe, multiply its whole circumference by its whole diameter, and that gives its superficial content. And as 7 is to 22: or 113. to 355: so is the Diameters squair to the superficies of the Sphere: and so is the Diameter multiplyed by the axis of a cylinder to its superficies: and so is half Diameter of a cone multiplyed in its side to the superficies of a cone: and so the squair of the chord of half the segment of a Sphere to the superficies of that segment.

As 1. is to 1.772454: so is the Diameter to the Root of a squair equal to the superficies of a Sphere. Or as 1. is to 564189: so is

the Circumference to the Rootsquair, that shall be equal to the superficies of the Sphere.

5. As superficial measure hath 144 Inches squair in one foot : so solide measure hath 1728. every solide foot is like a Die, for what it wants either in breadth or thickness it must have in length : for 12 times 12. is 144, and 12 times 144. is 1728. the cubesquair Inches in a cubesquair foot ; therefore;

In measuring a squair solide, multiply its length by its breadth, and that product by its deepth.

To measure a Cylinder (such as a Roller) multiply the Semi-diameter by the Semi-circumference, and that product by the length.

To measure a Cone (*viz.* it hath a Circular base, and ends in a sharp point) take the superficial content of the base, and multiply by  $\frac{1}{3}$  of the altitude or height.

To measure a Pyramid (*viz.* it hath an angular base, and ends in a sharp point) make use of the last Rule.

To measure a Sphere or Globe, (*viz.* a solid figure every where equidistant from the Centre) Cub the Diameter, and multiply that by 11. then divide that product by 21. the quotient is the solide content of the Sphere.

As 1. is to 80604 : so is the Diameter to the Root of a Cube equal to the Sphere. Or as 1. is to 3256556 : so is the Circumference to the Root Cube of a solide, equal to the Sphere.

As 1. is to 523599 : so the Cube of the Diameter to the Sphere. Or as 1. is to 909856 : so is the Sphere to the Cube of the Diameter.

As 1. is to 4016887 : so is the Cube of the Circumference to the Sphere. Or as 1. is to 59217629 : so is the Sphere to the Cube of the Circumference.

As 42. is to 22. or 1. to 5236 : so is the Diameter cubed to the Solidity of the Sphere. Or as 22. is to 42. or 1. to 190986 : so is the Solidity of the Sphere to its Diameter cubed.

As 28. is to 22. or 14. to 11. or 1. to 785399 : so is the Squair of



of the Diameter of a Cylinder multiplied by its side, to the solidity of the Cylinder : and so is the squair of the Diameter of a Cone multiplied by  $\frac{1}{3}$  of its Axis, to the solidity of the Cone.

As 1. is to 25; 1327 : so is the Diameter cubed to a Cylinder.

To measure a Regular Polygon, (as a piece Timber hewed into 5, 6, 7, 8, &c. Equal sides with both ends alike) multiply the semi-circumference by the Radius or semi-diameter, and that product by the length.

To measure a Truncus, (*viz.* a Cylinder that leans) take the superficies of the Circle, and adding the longer and shorter sides of the Truncus, take the half for the hight.

The Sector of a Sphere is measured by multiplying its superficies Spherical by one third of the hight.

The Segment of a Sphere measure it as a Sector, and subtract from the Sector the solidity of a Cone, whose Apex is in the Center, and base the Area of the Segment.

The solidity of a Spheroid is got by multiplying the greatest Circle into two thirds of the Axis about which the Spheroid is made.

The solidity of the Trunk of a Spheroid cut off with two Circles at right angles with the base, such as our Wine Caskes are, is gotten by adding two thirds of the Area of the Circle at the bung or middle together, and multiplying the same by the length.

Irregular disorderly Solids are measured by help of Water in a prepared Vessel exactly cubical, so large as it may contain it; according to *Archimedes*: put the body into the vessel, pour in so much Water as may just cover the same; and make a marke where the superficies of the Water touched the vessel; take out the same irregular body, and make a second marke where the superficies cuts the side of the vessel; then take the distance between the two marks in Inches and parts, which multiply by the squair of the side of the prepared vessel; and that product shall be the solidity of the irregular body sought.

6. If you would measure any superficies by the Table of Logarithms, then set down the Logar: of the length and breadth, add

H. 3

them

them together, and whatever their summe be, the number answering thereunto is the Area or superficial content. Which if they be falls and you desire to reduce them into Acres, then out of the Logarithm thereof subtract the Logarithm of 160 (the falls in one Acre) and there shall remain the Logarithm of the content in Acres. Or

If you would measure solides by the Table, set down the Logarithms of its length, breadth, and depth: add them together; and the absolute Number answering this Logarithm is the solide content required.

Also by the Table you may extract the squair Root (of any plot, field or other superficies) with great ease and quickness thus:

Take the half of the Logarithm of the given Number whose Root is required, and the Number answering this Logarithm is the squair Root sought. Or

For extraction of the Cube Root of any solide, take the third part of the Logarithm of the given Number whose Root is required, and the absolute Number answering thereunto is the Cube Root desired.

And to find a mean proportional (between two Numbers given by the Table) is to add the Logarithms of them together, and take half. As if you would have the mean betwixt 40. 5. and 72. Thus:

|                              |           |
|------------------------------|-----------|
| The Logarithm of 40. 5 is    | 1. 607422 |
| The Logarithm of 72 is       | 1. 857190 |
| The summes added             | 3. 464612 |
| The half of the Logarithm is | 1. 732356 |

The Number answering this Logarithm is 54. for the mean proportional.

To find 2, 3, 4, 5, &c. means between any two Numbers, take their difference, and divide it by a Number more by one than the Number of means desired, as if 3 means, divide by 4. &c. This Logarithmical quotient added to the last, finds the first mean next

it,

it, &c. As, if you would have three mean proportionalls betw. xt 4. and 64.

|                         |   |   |   |   |           |
|-------------------------|---|---|---|---|-----------|
| The Logarithm of 64. is | . | . | . | : | 1. 806180 |
| The Logarithm of 4. is  | . | . | . | . | 0. 602060 |
| The difference is       | . | . | . | . | 1. 204120 |

The  $\frac{1}{4}$  thereof is 0. 301030. which being added to the Logarithm of 4 makes 0. 903090. the Logarithm of 8. for the first mean: again added to this last, gives 1. 204120. the Logarithm of 16. and added to this, gives 1. 505150 the Logarithm of 32. which 8. 16. 32. ar the 3 means betwixt 4 and 64.

But because the extraction of the squair Root is so needful to be known, I shall demonstrate the same.

Example, If you were to find the squair Root of 576. Supposing it the squair of Fig. 18. Make first a dash at every other Figure, beginning allwayes at the first towards the right hand *viz.* at 6. and 5. that just so many Figures will be in the quotient or Root; then say, what is the Root of 5. answer, 2. is the nearest, therefore write 2. in the quotient and multiply the same, saying 2 times 2 is 4. write down that under the 5 and substract it therefrom, saying, 4 from 5 there remains 1. thus have you 20 the squair Root of G. i. c. f. (considering that there is yet one Figure to follow) and now you want the squair Root of the two oblong squairs, *viz.* a. b. G. b. and e. b. f. d. (out of which you must substract the little squair e. b. i. b.) therefore double your quotient or Root of the squair G. i. c. f. saying 2 times 2 is 4 write this down for your divisor one Figure forward *viz.* under 17. and use common division, saying how often can we get 4 out of 17. answer. 4 times, write that in the quotient and say, 4 times 4 is 16. that substracted from 17. remains 1. thus have you 4 the Root of the oblong squair, out of which substract the little squair once, because you have it twice by the former doubling the oblong squair; therefore multiply the side of the little squair, *viz.* 4 in it self, that makes 16, substract the same from

$$\begin{array}{r}
 11 \\
 576 \overline{)24} \\
 446 \\
 \hline
 1
 \end{array}$$

and there remains nothing : so 24 is the squair Root or side *a. b.* whose squair is 576.

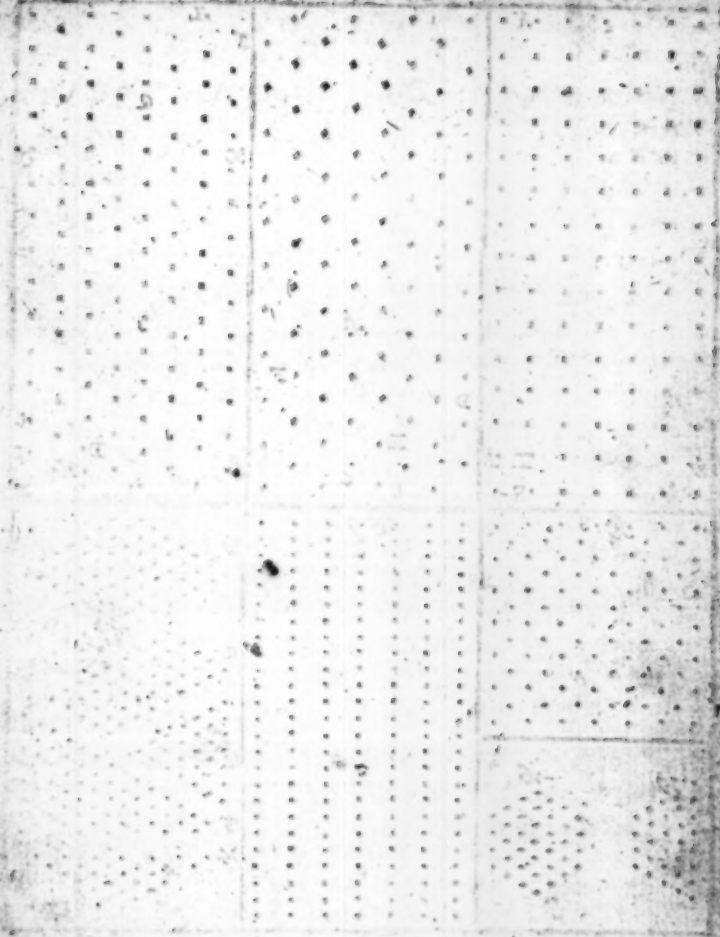
Example 2. If the squair of this plot be 543169. make the dashes, as before, *viz.* under 9.14. and say, what is the squair of 54. (the dashes so directs, and not to 5. therefore mind the usefullness of them) now the nearest squair Root of 54 is 7. But as in division, so you must look, if you will get the double thereof out of the remainders and the little squair too : If you mind this you cannot go wrong. But upon tryall I find it will so work, therefore set 7 in the quotient and multiply the same, it makes 49 write that down under 54. substract,

$$\begin{array}{r}
 13 \\
 204 \\
 15124 \\
 543169 \quad (737 \\
 494969 \\
 1144
 \end{array}$$

and there remains 5. This tells that the Root of the large squair is 700. (considering that there is yet 2 Figures to follow as appears by the 3 dashes) now double your quotient, that makes 14 (this is the length of the two oblong squairs) place the same, as in division, and say, how often can we get 14 out of 53. answer 3 times and, 11 remaining; now substract the little squair whose side is 3. Thus, 3 times 3 is 9; from 111. remains 102. There is the Root of other two oblong squairs wanting: therefore double the whole quotient *a. b.* 73 that makes 146. place the same as before, for division, and say, how often can we get 146 out of 1026, or gradually, how often one in 10. we get 9 ones in 10, but not 9 fowers, 102 which will remain. then try if we can have 8. No, therefore take 7 and set in the quotient, as before in common division, *viz.* 7 times one from 10. remains 3, and 7 fowers from 23. remains 4. and 7 sixes from 46. remains 4. lastly substract the little squair, *viz.* 7 times 7 from 49. there remains nothing. So the squair Root of 543169. is 737.

And if the Number be never so great, you may observe that the first operation consists of 3 parts. (*i. e.* first, finding the Root of the great squair; secondly, the Root of the oblongs by doubling the quotient and using common division; Thridly, substracting the little squair for the reasons above demonstrated.) The second operation (if there be more than one as in this last example) consists of 2 parts

James Brown with my hand made



1842

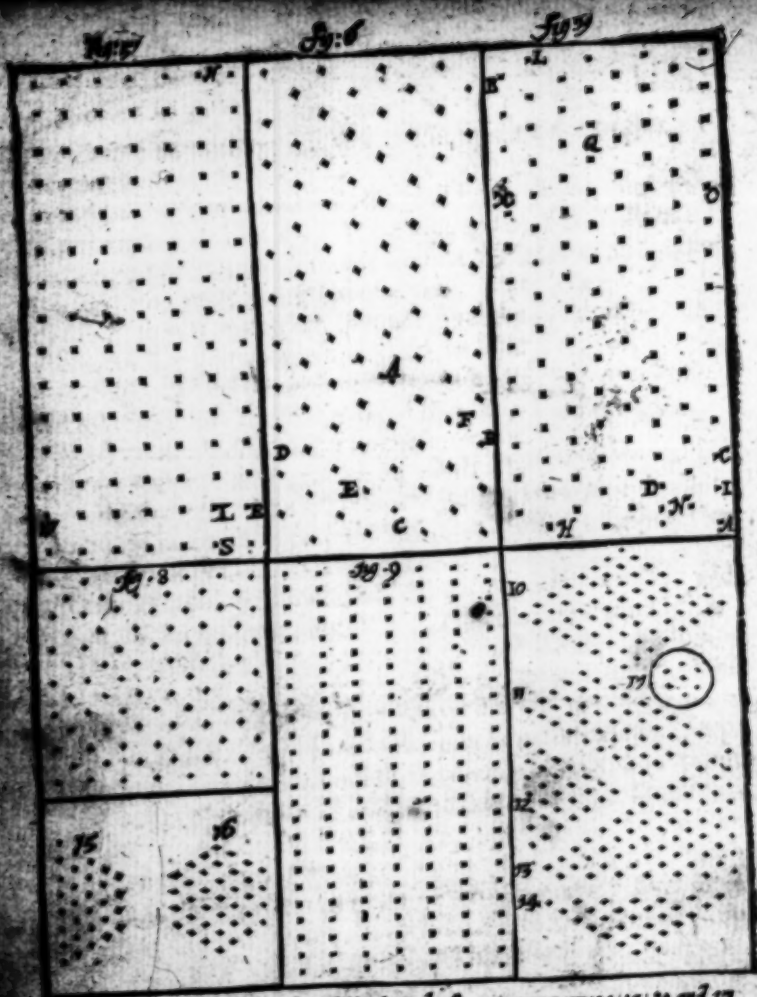


Fig. 5, 6, 7, and 8 By a Scale of 92 Ell in the Inch fig. 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, and 21 By a Scale of 84 Ell in the Inch

Alfred A. D. 1351112





Ob London 1396

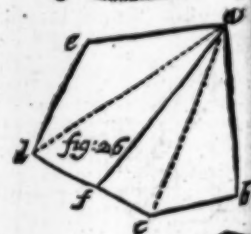
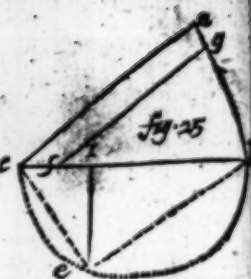
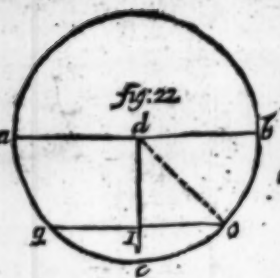
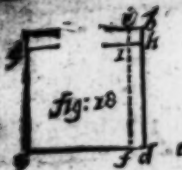


Fig. 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100. Scale of 42 falls in the inch, also fig. 19 be 42  
applied to 400 (and fig. 21 to 20) falls in the inch and fig. 24, 25, 26, and 27  
in 40 falls in the inch

5  
28  
30



28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
75  
76  
77  
78  
79  
80  
81  
82  
83  
84  
85  
86  
87  
88  
89  
90  
91  
92  
93  
94  
95  
96  
97  
98  
99  
100

JAMES S/B ROLL

Fig. 1



Fig. 2

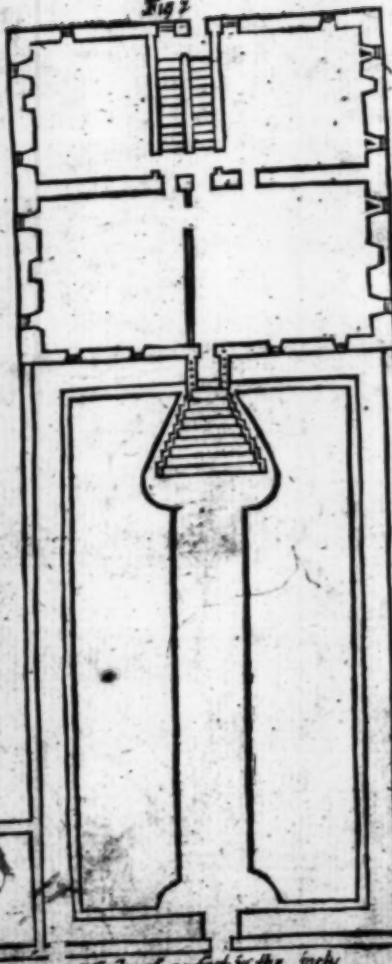
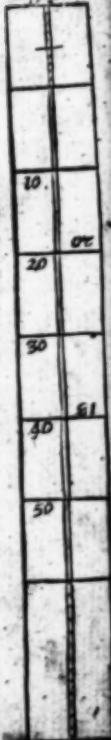
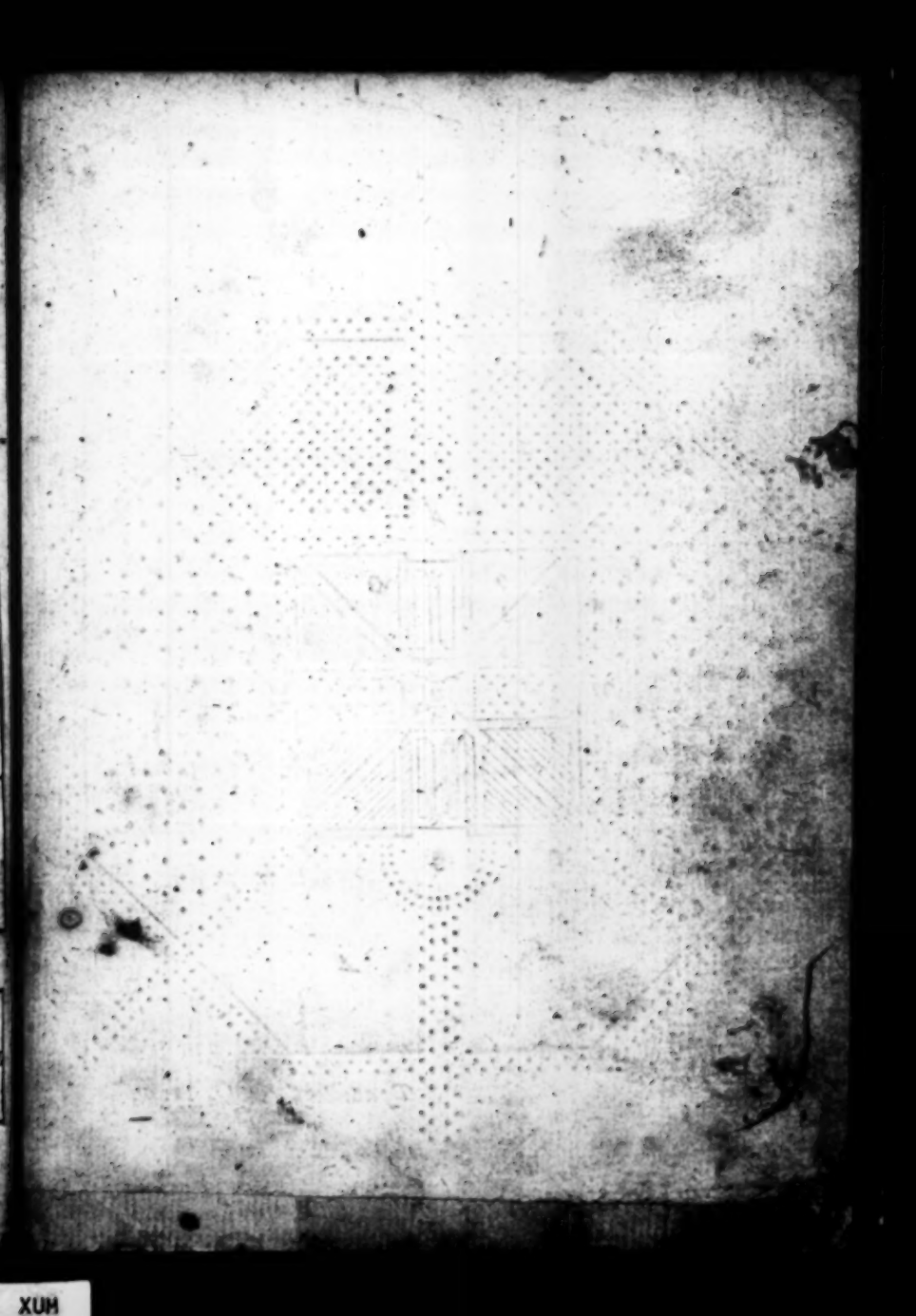


Fig. 3

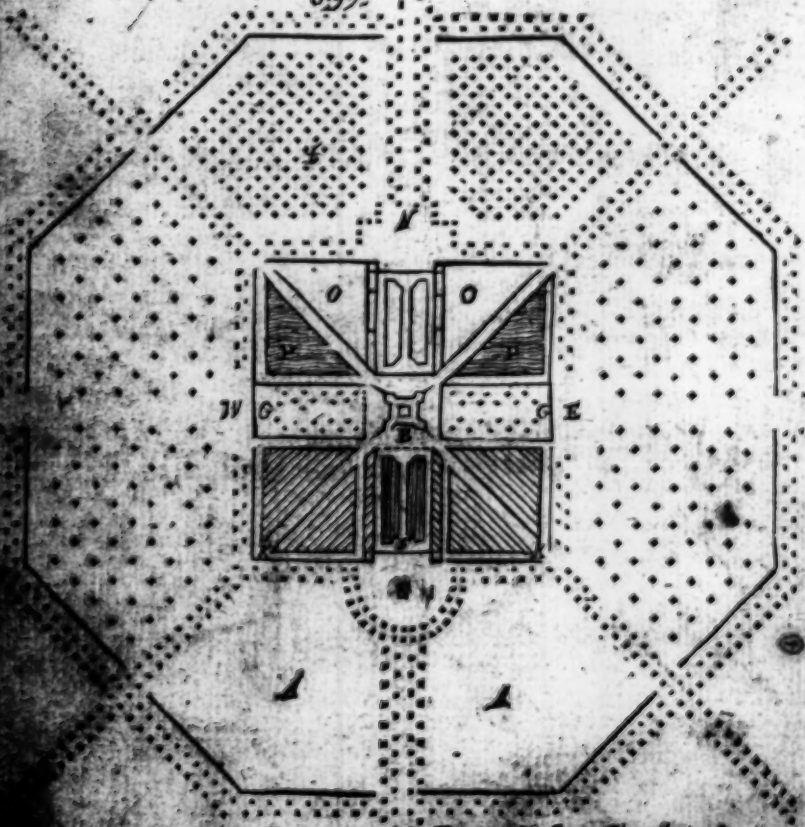


a scale of 20 feet to the inch



*This is how to plant mealy*

fig 2



*By a*

*By a*  
1320167



2 parts viz. first the doubling the whole quotient for your divisor, by which you divide your dividend, as in common. Secondly the subtracting the little squair; (whereof the last Figure in the quotient is allwayes the Root) and hencefurth in every operation, if never so many, you must allwayes now proceed as in this second operation.

But to find the squair Root of a Number consisting of whole Numbers and Fractions, as 930.25 the squair of fig. 18. work as if all were whole Numbers, as before, untill one Figure of your divisor come under the Fraction of your dividend, and then the rest of the quotient is Fraction, as in the Example is plain.

$$\begin{array}{r} 930.25 \quad (30.5 \\ 960 \ 05 \\ 62 \end{array}$$

But to find the Root of a Number, that is not a squair Number, as 19. fower is the nearest, and there remains 3. 19 (4 now, how to know the denominator of this Numerator, 16 is to double the quotient and add one to it, and that is allwayes the denominator to any Fraction happening in Roots; here the Root of 19 is  $4\frac{3}{4}$ .

I have given you the Geometricall demonstration of the squair Root, which shewes the reason of its Arithmetick operation; and this I could never find in any Book.

I confesse I need to Apologize for these and the like digressions, but the earnest desire of severalls forced me.

*Place the Figures here.*

...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...

...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...

...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...

...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...

...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...

...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...

...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...  
...the ... of the ...

THE SECOND PART  
Of the  
SCOTS GARD'NER;

*Treating of the Culture of Plants.*

CHAP. I.

*Of the several wayes of propagation.*



Am not to discribe the varieties in the Tribes and Kindreds of Plants, (seeing I am not now writing a Herbal) but only what is most material to their propagation and improvement: wherefore I shall shew,

First in general the several wayes of propagation, and then particulary some of the most usefull.

2. The several wayes of increasing them are.

First by seeds, Kyes, Kirnells, Nuts, Stones.

Secondly by off-sets, Suckers, Slivings taken from the mother-Plant.

Thridly by Cuttings, Stems, Slips set without Roots.

Fourthly by laying the branch of a growing Plant down into the Earth.

Fifthly by carrying up soil to it, where it will not bend down.

Sixthly by various wayes of Graffings.

Lastly by several wayes of Inoculation.

The business of this Chap: is to shew the manner and time of performing each of these wayes.

3. And first by seeds, choice, them from the fairest Plants, full ripe, the day fair, and Plants dry. Lay them in the Sun and open air a little, some for Rubbing out, others for winning in their husks. And as you should not sow Beans, Kirnells, Nuts, or Stones with the Fleishy part on, (but eat or Rub it off by Rolling in sand, and then dry them a little) so nor walk, Weet, or steep them. Neither keep any long after they ripe, the most part will keep till spring, but then many will ly till the next, especially stony Seeds, Berries, and Kirnells. I do not mean, *Ash, Holly, Tew, Mezeriom, Hawthorn, &c.* Who naturally lies a year longer, albeit sown immediatly when gathered, yet even some of these namely the holly will ly sometimes a year longer than their usuall time, if the fleshy part be not Rubbed off.

I might say something of the timely Interring Tulips and others, but I come to the manner of sowing: which is, To cover the seed with the mould, whereof there is several modes according to the nature of the seed, Soil, season, or fancy either to sow the Ground and turne the seed in under the furrow, or by drawing trenches in the soil, and then drawing the earth over them with a haw, or sowing the bed ready drest and hacking in the seed with the same Instrument, or by Harrowing, Raking with a Rake or drawing bushes over the sowed Ground to cover the seed, or to put off the surface of the whole bed with the Rake head and sow thereon, then draw on the mould again with the same, and having cast up the furrows with a shovell, smooth the bed with the Rake, or make drills by lines in made up beds, sow and cover the same with the Rake head, not disordering the Ranks, or to set the single seeds with sticks by lines, or to sow the bed, and then to sift fine mould thereon, &c.

Sow the strong and hardy deeper than the small and tender, and sow earlier in spring than before winter, and deeper in a light, than in a stiff soil.

Albeit

Albeit I use for the most part to Plant and sow every species by themselves, yet you may sometimes use mixtures, as Carrots and Radish in one bed, because the Radish may be gone ere the Carrots require much Room. Among new set Liquorish sow Onions, Radish, Lettice, and you may sow Radish, Lettice, Parsly, Carrats, Parsneeps together, gathering each in their seasons, the Parsneeps will stay till winter. And drop Beat-Rave or parslly in your onionbeds to stay winter after onions are gone. Also Beat-Rave, Skirrets, Beans, at considerable distance in the Intervalls of new Planted Artichocks, also at a great distance among cabbages, or in the edge of the furrows of other beds.

The most naturall time for sowing is, when the seeds of their own accord falls into the ground, nevertheless that many doth well at this season, as stony seeds and such as can endure winter, yet the tender which are many with us, doth best in the spring, but for convenience we sow at severall other seasons, as in summer, (at which time they require watering and shade) and in Autumne (which is the only season for some) who if tender requires defence & shelter; nor can we have others early at spring without hot beds, which is required in speciall by such as comes not to perfection in our short Summer.

Endeavour to sow when the soil is in good temper, a hot-furrow is good, but some grounds will not harrow or Rake when new dely'd or Plow'd, which when exposed sometime to air, Frost, Sun, and Showres doth crumble and fall tender; hence ought such to be prepared by fallowing. See more particularly the manner and season for each sort in their respective Chapters following.

4. Suckers are these which growes, Runs, Springs off, or about the mother-Plant; whereof is made off setts by severing or parting them off therefrom.

Take off these on Trees and shrubs with a violent but cleanly pull, be carefull of bulbo roots and Anemonies, that you wound not the mother-Plant.

To force such as are unapt to put forth Suckers naturally, you may

may bair the Root, (of these of a woody substance,) cut it into the pith, slit it down a little, and put in a stick to keep the gap open; level in the earth again: so shall that lip raised spring, (and so much the better if there was an eye immediatly below the cut.) When the branches are grown, cut off this Plant to live by it self.

Another way is to cut the Root through a little distance from the Tree, with a cleanly slop down-wards, and raise up the butt-end of the Root, so cut off till it be a little above the surface, as for Root grafting hereafter discribed. level in and trade the Earth again: so shall the piece left at the Tree send forth young Roots, and the Root so cut and raised send out a Top.

Better Earth for Bulbs and other Roots, will assist them to put forth Suckers.

Cutting the Tops of Fibrous Rooted-herbes, in growing-time will help them to off sets, and to last long too.

The season for severing off sets of Hardie-trees that lose the leaf, is latter end *October* and beginning *November*, albeit you may also any time till *March*, weather open.

Young Tender-trees, with Hardie-greens, let the winter frost be over, and before the sap rise, *April* best for greens.

Bulbo and Tuberous Roots, when they have done springing *i.e.* their stalkes and leaves beginning to wither.

All Fibrous Rooted-herbes, when springing and before they run up to Flower, albeit you may Plant many after the Flower is past, Stalkes and leaves cut, and they springing a Fresh. But the first spring is best.

In drought, Water Shrubs, and Fibrous Rooted Plants, upon their first Planting, at least shade from the Ensuing scorchings, by covering the surface with some vegetable or leitter and Water through the same if needful.

And though you must Water Tubro, and Bulbo Roots, in drought once in two three dayes; yet be sparing, and defend them from too much Raines.

5. To



5. To propagate by cuttings, is to cut off the branch or stem of a Plant, and to set it in the Earth without Roots.

Strip it of leaves and branches, Plant deeper than these with Roots, and in a rich and moist soil, keeping it watered and shaded, Untill Rooted; cut off their Tops save Greens, as if your cutting be 12 Inches long, let 9 be under, and 3 above ground.

The better to effect their Rooting, (if a hard substance, as Yew, Quince, &c.) Twist there ends a little or cleave them a piece: If tender Plants of great Pith as Jasmynes, July-flowers, &c. Cut only at a joynt or knot, and plant them: If large stems of Pithy Trees, as Poplars &c. Sharp their ends down to a point, reserving the bark whole on one side.

If stock July-flowers, slit the Bark near the end in several parts round the Stem, fold up the Bark so cut, and taking the peel'd part close off, Plant the same with this Bark spread as you do a Root.

The time of planting cuttings is, (if Trees & Shrubs,) a little before they Spring, and if Herbes, when springing, as above for off-sets: and let the Stems of July-flowers, and Wall-flowers be well shot *i. e.* something firme, and take such as has not had a Flower.

6. To increase by laying is to bend down some branch to the ground, and with a hooked stick thrust into the ground, stay the same in its place, and cover with earth of deepness as you see fit: let the soil be good, watered and shaded in drought, and from scorching Sun sheltered in Winter, if needfull.

To force their Rooting (if July-flowers) Prune off the under and withered leaves, and cut it at a joynt into the pith (*i. e.* half way through) and slit it up to the next joynt, thrust down the cut part Gently into the ground, making it fast, cover as before. If Trees and Shrubs, prick the rind full of holes at the place intierred, or cut away the Bark round at the same place: but if the branch be small, use it as July-flowers, and if any refuse, ty them hard and fast above the slit with a piece Pack-thread or Wyre, to stop the sap in the course, that it may provide for Rooting. Cut off all their Tops as

you lay them, except Greens and some very Pithy Trees.

The time for laying all Trees and Shrubs that lose the leaf, is *October*, as also *March*, if secured from drought. All Greens in *April*, which therefore must be shaded. July-flowers in *March*, *April*, or *July*.

The Trees and Sherubs will be Rooted that time twelve moneths at which time transplant them. the July-flower layed in *March* may be transplanted in *July*, or if layed in *July* transplanted next *March* or *April*.

7. Circumposition is in all cases, as laying, save only that the earth must be raised up to the branch, because it will not bend down to it. Therefore fasten a Pot, Basket, old Hart or the like on the Tree (by a stake or some supporter) let it have a hole in its bottome, through which you must put the branch to be propagated, and then fill the Pot with rich earth, (having ordered the branch as before to cause it Root) and Water it often; willow earth or Rotten willow sticks at the bottom of the Pot helps to retain the moistuer. I have effected this with clay and Cowes dung well mixt (after part of the Bark has been taken off round) clapt about with a double or triple wrapping of Straw, or Hay Roaps.

This is in midsummer as well as Spring-work, and very notable for to propagate such as can scarcely be otherways obtain'd.

8. Grafting is to take a cyon or twig of atree and place into another (call'd the stock) fit to receive the same that the inward bark, or end of Both may Joyn & saps unite, &c. Whereof there be several wayes, as.

First of Grafting in the clift, saw off the head of the stock in a square place, about half a foot above ground, for Dwarfes and Bushes; as also for Standard, Aple, and Pear (for they will grow up for a body) but betwixt 3 and 4 foot for Standard-cherry, and Plum. Pare smooth its head Ragled by the saw, then cleave a little beside the pith, and with your Pen-knife cur away any jags, or blackness that remains after cleaving on each side (if any) then prepare the graft by cutting on both sides from

from some knot or bud in forme of a wedg suitable to the clift with little shoulderings, not Ragling the end: for if the bark be raised at the tail or lower end of the graff, (especially the Cherrie) Impeds its growing, cut off its Top about 2 Inches above the shoulderings close behind a leaf-bud; then open the clift with the Graffing Iron, set the graff (or two Graffs if the stock be great) in the clift, so as the inward part of the rind of the Graff may joyn exactly & close to the inward part of the Bark of the stock, and if it Pinch, as great stocks will, ty it not as you must do the smaller: or put in a little wedg Gently to keep it, take a Slice-bark (from the cut-off head) and cut a hole therein, as it may slide on, & joyn round the butt of the Graff, and cover the stock close over in forme of a hawks hood. lastly cover with clay tempered with Horse-dung, that hath a little short leitter in it, or with soft wax for smaller stoks: this is to preserve it from cold & drying-winds, and from wet which harms most.

Note, if the stock stand perpendicular, set the Graff on the West-side: if not, then place it on the upperside: if you fear winds support them with sticks as Splinters to a broken bone.

Unbind, when you find their bands harme them, towards midsummer, at which tyme top such as has shot so large as to be in danger of breaking with the winds, especially them Graffed in the Bark hereafter discribed.

Pull up Suckers, close and cleanly from the Routs: also Rub off buds that appear on the stock. Graffs cannot thrive or prosper, if the stoks be uncleanly or illthiving, and this is occasion'd through bad training.

Another way of clift-Graffing is, to cleave the Graff and not the stock. Thus: prepare the stock and Graff as for shouldering (next discribed,) then with the Pen-knif, cleave the inward face of the Graff in the cut part, and cut up the stock with a flop, so that one lip of the clift-cyon may be bound on the one side of the stock, and the other longer lip on the outside, as in shouldering.

The Graff fits here, as on a saddle, with a leg on each side the stock.

K

and

and therefore will better resist the Winds; as also the wound caused by the cleft, will soon recover. I have them wholly healed the same year, wherein I Grafted them.

Shouldering is to cut off the head of the stock, and smooth it, as at first; then cut the Graff from a knot, or bud on one side sloping about an Inch and half long, with a shoulder, but not deep, that it may rest on the head of the stock. the Graff must be cut from the shoulder smooth and even, sloping gradually, that the lower end be thin: place the shouldering on the head of the stock, and mark by the end of the cut part of the Graff, and cut away so much Bark of the stock as the Graff did cover; then place both together, that the cut parts of both may joyn and saps unite one on the other: bind them close together with bass, and hood them with clay tempered with dung or wax, as before.

Grafting in the Bark may be used in greater stocks, or in re-grafting of old trees, and is only for aples; because later in performing, which may be the latter end *April*, when the Bark of the stock will peel: for when both stock and Graff is prepared, (as in shouldering) instead of cutting away some Bark of the stock; for receiving the Graff you must slit it on the South-side from the top almost as long, as the sloped part of the Graff, and loosen the Bark at the top of the slit with the point of the half round wedg, (made a purpose tapering down-wards to a point) which also thrust down between the Bark and stock, to make room for the Graff; but first cut a little Bark at the thin end of the slope of the *Cyon*, that it double not in going down, yet leave it with a sharp edg; and because when the *Cyon* is put in, it will bear the Bark hollow from the stock nicks or slit, the Bark on each side the *cyon*, so that it may fall close to the stock and to the edges of the *cyon*; then bind and cover, as before.

Grafting by approach, is good for these that holds not well otherways: but herein the stocks must be placed so near the Tree, (where the grafs are) that the branch may reach it; then may you cleft or shoulder-graft the twig you mean to propagate, into the stock, and as soon as graff and stock do unite and are incorporated together,

cut

cut off the cyon or graff underneath, close to the grafted place, that it may subsist by the stock only.

Root-graffing is, to take the twig of any Tree you mean to propagate, and a piece Root of the same kind (cut and Raised up a little as in sect 4.) and graff them by shouldering, uniting the buttends of graff and Root, causing the rind of the Root Joyn to the rind of the graff, and so bind them: the next year they may be Transplanted to nurserie; these will be easily dwarfed, & readily hold, beside that the defect of Stocks is supplied, and they fit for transportation.

There be many other wayes, but these nam'd are the most material.

The time of graffing is, when the sap beginnes to stirr in the spring; you must begin earlier with Cherries, Plumes, some later with Pears, ending with Aples.

Chose not your graffs from such Trees as are ill-Bearers, neither from such as has not come to bear at all, but from constant and well bearing Trees, and the fairest and fullest of buds thereon: let them have a piece of the precedent years shoot, whereof make the tail and shouldering Immediately below the butt of young wood; and if the stock be large, make the graffs wholly of the last years shoot; and such (having blowing buds actually upon them) I have seen bear fruit the same year. But some old bearing Trees yields no graffs: wherefore you may cut out some great branch, that it may shoot a new, or rather take off the same branch by circumposition and plant; the which new Tree may furnish you with graffs. Cut your graffs ere they sprout, and keep them or carry them, their ends in clay, or dry in a box, their tops cut off.

9 Inoculation differs from the former wayes of graffing, and most proper for Apricocks and peaches: any sort will more readily hold by this than by graffing, except Cherries; they come quickly to be a Tree: for I had a plum shoot above 6 foot, 10 Inches the first year; and tho they miss, yet the stock is not the worse. Therefore,

In some convenient and smooth part of the stock (at the same height as for grafting) with the penknife cut the rind overthwart, and from the middle thereof gently slit the bark about an Inch long in forme of *a T*, not wounding the stock; then nimbly prepare the bud by cutting off the leaf till a little of the tail, then slit the bark on each side a little distance from the bud, and about half Inch above and below the same, sharp that end below that it may the more easily go down, and having a quill, cut more than half away about an Inch long at the end, (for dividing the bud and rind from the stalk) therewith take it off dextrously and leave not the Root behind: for if you see a hole under the bud on the inside, the Root is gone, cast it away and prepare another. when the bud is ready, then with a bone (made half round and sharp at the point tapering on the one side) raise the bark or rind on each side the slit carefully, not hurting the inner rind, and with care put in the bud, thrusting it down till its top Joyn with the cross cut: then bind it close above and below the bud with dry'd Rushes or bafs. Or,

You may slit the bark of the stock upwards from the cross cut. Or, Cut the edges of the bark about the bud oblong squair, and the bark of the stock fit to receive the same. Or

Reserve  $\frac{1}{4}$  of this squair piece bark of the stock untaken off at the upper end, which must be raised, that the shild may slide up betwixt the same and the stock; and so bind gently, as before.

The time for Inoculation is, when the sap is most in the stock, namely from *June* till *August*, neer a moneth after unbind *i. e.* cut through binding and bark with a gentle slit on the back side of the stock, leaving the binding to fall away of its own accords: at which time you will see who holds. In *March* following, cut off the head of the stock 4 Inches above the bud, and that time twelve moneths the stub too, that it may heal over the wound. you may prune as grasses, and pull up suckers &c. See Chap: 4. for more.

Choise buds from good bearers, as before, take them from the strong and well grown shoots of the same year, and from the biggest end of the same, and if you must carry them farr, first cut off their



their leaves, and top of the Stalks and wrap them in moist leaves or grass.

This much at present in general for time and manner of the several ways of propagation.

10. In planting all plants prune their Roots, that is, Top them a little with a sharp Knife except Asparagus. Also cut their heads except Greens, and Tops of Forrest-trees ordain'd for Timber, yet the Side-boughes must, that the head may be proportion'd to the Root.

Plant no Trees deep: (albeit some deeper than other) when their Roots runs near the surface, there they receive the beneficial influence of Sun and Showres, that makes vegetables fair and Fruitfull.

Lay leitter or the like above ground the Compass of their Roots, especially the first year of planting. and indeed all plants require some shelter & shade with Moisture, when first planted, till they get Rooting and strength.

Cut the leaves and stalks of flowers and herbes, when past flower or yealded seed, nor at any tyme suffer too many, rather purge them in tyme. no more branches, flowers, fruits on any tree, or plant, than the root can nourish perfectly.

Neither plant and sow every year the same plants, on the same Ridg or Bed: for it Improves them to be changed. see more fully planting, pruning, preserving, &c. in their respective places following.

## C H A P. I I.

*How to Cultivate, and prepare grounds.*

I. **H**AVING shew'd the several wayes of propagating plants, it is also most requisite that you prepare the ground for effectuating the same. And that is in the first place,

To trench it, *viz.* Begin at one end of the ground, (you mean thus to culture and open) a trench from one side to the other, thereof; or 4 foot broad, and from one to two foot deep, as the quality of the ground admits and plants require (therefore liquorish must have deeper,) this being open, measure off other 4 foot parallel at its side, turne that into the open trench, with the turf or surface in the bottome, and the clean earth on the top; the filling whereof emptieth an other, therefore cut off other 4 foot and turne that in as before; thus trench by trench till the whole be finished. I presume you carryed the earth of the first trench to fill the last, or otherwayes filled hollowes therewith, and left the last trench open, (if convenient) for receiving weeds. Or if the ground be hollow in the middle begin there, and trench both wayes to help the level; if high in the middle, begin at both sides or ends till the two open trenches meet at the height, for the same reason.

The latter end of harvest the ground is softest for trenching, and it lying all Winter open to the weather is thereby meliorated. For as trenching doth well prepare hard, barren, and untill'd ground, so doth it such as is exhausted by long and unskillfull usage. and if at every trenching you apply proper manures mixt with the second spading, or under the last shovelling, and in 5 years retrench, it will become to your wish, for all gardens, and plantations.

2. The next excellent way of preparing ground, is fallowing; begin as soon as you reap the crop, but let the ground be something

thing moist, albeit you should stay for a showre, if this be not late in Autumne, you may fallow in *November*: especially if stiff ground and restirre in *March* or *April* when you plant or sow; and albeit you should neither plant or sow it that year, keep it clean of weeds in summer by hāwing, &c. and at Autumne fallow again. but as in trenching so in this work you should mix with proper soil.

Make use of the *English* fashion of spades which are now common, and let every two delvers, have a shoveller to cast up the small that falls in bottom of the furrow, and the Delvers should turne up the point of the spade, and nimble break and chop all the clods throughly; this is very material as well as the through mixing of the manures with the soil: So that mixing, stirring, restirring, fallowing is most pertinent for the cold, chilled, barren Rugged-natur'd-ground in *Scotland* all which softens and tenders it, and so fits it for nourishing good seed and plants, as I can tell by experience, therefore.

3. I advise our Husband-men also to the fallowing of their land, as one; flitfolding the same, as a second; Watering, or overflowing land, as a thrid, burning the Turf as a fourth, draining excessive moisture, as a fifth; applying proper soils and manures, and that at proper seasons, as a sixt; laying the land to rest, as a seventh; and above all, inclosing and planting about their land, as the last, and best improvement.

Example: At the Autumnal fallowing, delve, or Plow deep, and apply hot unrotted and uncompound dungs and manures: at spring re-plow or re-delve, and apply such dungs and manures as has layn mixed and rotted with Earth; then Mix, Rake, or Harrow. The summer following is to destroy the weeds, and may be done by Turf, Plough or by hāwing.

The Husbandmens flitfolding is equivalent to Gard'ners covering the surface, especially of dry and barren ground with leitter, &c. The dung and urine of Sheep and cattle washes evenly into ground, and should be turned down by the summer, and

and Autumnal fallowing, lest its substance exhaust by Sun and Air, (except that for grafs, then only harrowed with a bush of thorns) instead whereof Gard'ners should top their coverings of lester with a little Earth or Sand, and at Autumne delve all down together.

Husbandmens watering is by Running Plough-furrowes (and trenches where needful) alongst or cross their land, so as the water may gently sweep over the whole: this in the Winter, on dry and barren grounds, which leaves Sulphureous pinguidity behindit, and strongly improves either for grafs or corn; but that this Husbandry ought as well to be practised on wet grounds, is evident, that the Running of this carries away the sower quality of the other. I shall speak of Gard'ners watering more particularly.

Burning land is, to pare its surface with the Turf Plough and lay the same in heaps to burn; and so spreads the ashes: but if moss and heath, set fire through, without turfing it; this destroys the noxious sower nature and the salt remains in the ashes, for the strengthening the Spirit of the Earth.

Draining the wet, bogie or dropical ground is, by trenches a little deeper than the Spring, (how deep soever) and then apply lyme, soot, ashes, pigeons dung, &c As for the abounding of superficial water, that is easily helped by common waterfowers, or in some grounds by sinking holes down to the channel.

As the Husbandman should have his land layed out or divided into several closes, some for corn, some for meadow, and others for pasture: so when he has taken 5, 6, or 7 crops of corn, he should lay it out for pasture, otherwayes it will wear out of heart; and likewise the pasture must be plowed up for corn, especially when it begins to grow mossie.

The way that the Gard'ner turns his ground to rest, is by trenching and retrenching, whereby it can never wear out: altho he also observes to change the crops as well as the Husbandman.

How

How to Inclose and plant about your land see Chap. 4.

4. Among all the Varieties of soils, that next the surface of them is best, because prepared by the Influence of Sun and Showers,

That called a loam or light brick Earth is the most natural ground for gardens and plantations; strong Blew, White, or Reid clayes are worst: but the nearer they be to a mixture of loam (or if they have stones naturally in them) they are the better; also, the nearer gravelly or sandy grounds incline to loam, so much the better. therefore if your ground be stiff, trench with ferns, straw, bean-ham, thatch, leitter, Earth under woodstacks, small sticks, &c. If gravelly or sandy, then trench and mix with loam or the upper part of clay, the Turf of both is good.

If strong clay, trench and mix with fat sand, highway Earth that hath drift sand in it, Rubish of buildings, Lime-Rubish, gravel. And if it be for gardens or orchards, enrich it with dungs mixt with drift-sand or light mouldheaped up *stratum superstratum* i. e. laying by laying. And if the ground be cold, the more pigeons and poultrie dung you put in it, the lighter and warmer it will be. Or make *Stratums* of Earth, dung and unslaked lime-stones to ly a year, and then apply this composition, which has been hitherto a great secret: therefore prize it.

Binding grounds, which will not Rake as you delve, if dry and hard, trenching and fallowing exposeth them to be softened by weather, as is said: But if wet and tough, mix with Ashes, sea-Sand, &c. In Culturing.

For preparing my composts, I use a pit (wherein sometimes I make a hot-bed) oblong, about 4 foot deep of length and breadth, as I can get dungs, Vegetables, and soils to fill it: here to lay all Kindes or sorts with *Stratums* of Earth, as horse, neat, Sheep, Pigeons, and Poultrie dung, ferns, weeds, leaves, foot, ashes, sticks, saw-dust, feathers, hair, horns, bones, urine, scouring of poudes, ditches, blood, pickle, brine, sea-water, the cleansing of House of Office, &c. Let them ly a year at least,

L

but

but not above two: then take them out and there Stirre, Air, mingle and work them with fresh Earth or by themselves, as you have occasion, till they become sweet and of an agreeable scent; (yet retaining their vertue) this frees them from the noxious qualities they otherwayes retaine, and consequently not so apt to gender or produce Worms, Weeds, and Mulhroms instead of wholsome and pleasant plants, fruits, and Roots for the table.

5. Observe what manures are proper for the soil, as, all hot-dungs and manures are proper for cold, stiff, and moist grounds: so all rotten and cold dungs and manures are proper for dry and hot grounds. All manures that retaines moisture are for poor, Sandy and Gravelly soils.

As, Horse-dung for stiff and cold ground; Sheeps for hot and dry; Ashes for cold, stiff and moist; old Woolen-rags for poor dry; Lyme most excellent for moorish and heatly land; Hair of Beasts for dry and stiff grounds; pigeons and poultrie dung for cold and moist; Rotten saw dust for dry; Rubish of buildings for stiff, cold grounds; Salt for cold and moist; use it moderately, it destroyes vegetables on dry ground, especially at first, but when melted by Winter Raines, it fertilizeth: Some has sowed it on moist, moorish land to great advantage, for being farr from the Sun we have little volatile.

6. In your applications you are to consider, that Rotten dungs and manures are proper for Trees and such slow growing plants, and unrotten dungs and manures for Annualls, they being quick of digestion.

Let not the Root of any Tree stand on dung, farr less unrotten dung which burns them; but upon prepared and proper soil, and composed, well mixed, aired, stirred or fallowed. Most fit is the cleanings of streets and highwayes together, with the mud and scouring of poudes and ditches, if first layed on heaps in the open Air to rott and sweeten, and if you mix it with stratoms of Lyme that adds much to its goodness and fertility.

Forrest-



Forrest-trees require not so much dung as Fruit-trees, but well mixed and fallowed soil.

Kitchen Herbes and Roots requires very fat, light, warme and well cultured ground.

Flowers and fine plants cannot endure soil too rank with dung, neither can they prosper if it be poor; but fresh, clean Earth with rotted neats dung well beaten and mixed together, and a little rotten willow Earth a little below the Roots: here comes in that delicate soil, the Turf of the pasture mixt with a little Lyme, Cowes and Sheeps dung, well rotted and mingled as before. See more particularly what soil each kind or sort of plants delights in or loves best, in their respective Chapters and Sections following.

7. As for making the hot-bed for raising early and tender plants, dig a pit (4 foot deep, and of length and breadth, as you have occasion) in a convenient and warme place, lying well to the Sun and sheltered from winds (which you may help by art, if not so naturally) fill it with dung and leitter from the Stables, about 12 or 14 thights gathering, (some makes it of Barley-straw, or the same mixt with bran, because it keeps heat long, and its heat not so excessive nor so noisome to plants as dung) and when well Tread, and even on the Top, lay about 4 Inches thick of rich, light (but fresh and clean) sifted mould thereon: arch it over with sticks, and cover with matts 4 or 5 dayes to cause it heat, then uncover and give it Air a day or two, that its violent heat may pass; then sow your seeds, and cover the bed again. And the next day if you find the bed over hot give it more Air, if too cold cast some Straw on the covering, untill the heat returne; so by airing and covering you may keep it in a constant temper: when the Seeds come up, give them Air to dry the moisture raised by the heat of the bed. How to cover the choice with Glasses, see Chap. 6. Sect. 1. But as there is great trouble in rightly ordering this sort of hot-bed; so here remedied by a better, which is only to fill and tread the pit full of new dung and leitter, (not covering it with Earth) and place wooden cases therein, about 9 or 10 Inches deep and about 3 foot broad, (having wood handles

at the ends) boar them full of Auger or Wimble holes at the bottom, fill them with the foresaid earth; and therein sow your seeds: and these cases and the earth in them will be kept warme during the whole season, wherein a hot-bed is necessary, for if it lose heat add fresh dung and leitter under, about and betwixt the cases; (there is Dew on the Glasses, while the heat remains, but if exhausted, they will be dry) consequently the trouble of transplanting from one hot bed to another is hereby saved. Provide a shelter over the whole, if you please, and frames of Glas over some of the inside cases, where there is most need; others you may leave open, as your Seeds requires. By this your pit and cases are every year ready to your hand, requiring only a supply of fresh dung. But this pit will be so much the more excellent, if lyn'd round at the sides with brick: and where you cannot conveniently sink it for Water, you may build the same above ground. And when this pit is empty it will be also ready for wintering of Flower Pots with *July-flowers*, &c.

8. In watering plants, use not well-water, especially for tender plants, neither Rivers that run long and quick on sharp gravel: these yields no nourishment to plants, but rather chills them; therefore if you must use such, let them stand sometime in the Sun and open Air, uncovered in tubs, mixt with dung, and powr it off the dreg when you use it. let the quantity and quality of the dung be according to the nature of your plants (as if great growers and require much heat, put horse or pigeons dung into the water, but for the more durable put Sheeps dung) remembering if your ground be bad, to add the more dung.

When dung lyes above ground about any plants, (as I use to do with Trees, Artichocks, &c.) The water descending through the same is very relishing to the Roots, if you powr the water at a little distance round the Tree: for when lashed on the stem, it washeth the Earth from the Roots.

Water no plants with standing, stinking Ditch-water, nor no Water that stinketh: Rain-water and large Ponde-water is excellent, but keep it not too long; yet if in a large Vessel, the of-

oftener you Stir it, the longer it will keep sweet: so the larger your poudes or Rivers be, and the opener to the Sun and Air, and the more moving by horse, geese and ducks their Sweeming, the sweeter it will be. and if the washings of stables, streets, dung Hill-water, &c. Run into them, that adds much to their fertility, providing they have some moving, as is said, to make them sweet.

If you fear dry weather differre not too long, but water while your ground is yet moist; differre not, if you mind to water at all. these that Root deepest, water most. and also when you do begin, Continue it so long, as you find occasion. In watering Trees and greater Plants, stir and waken the Earth a little about their Roots with a fork, so as it may drink the more evenlier, minding to tread firme again. And for the same cause you may sink the Earth a little in forme of a shallow dish rownd your Coleflowers, Artichocks, &c. Dip your Flower Pots in a Tub of water, to drink through the holes at the bottome.

When you water beds of small seeds with the watering pot, shake it nimbly, that it may fall like a showre of smal Rain. I have often made use of a handful of small Straw or Hay drawn as thatch, tyed in the middle, and at one end powred water with a Cup, and shakéd the same that it appeared like a Gentle bedewing rather than a glutting Rain.

Some that are desirous to have the ground allwayes moist about any plant, do place near it a vessel with water, and in it a piece woollen clothe with one end thereof hanging out to the ground, and the other in the water: the Cloath being first wet, it will drop continually, if the end without be lower than that within the vessell: and when the water within fails, it may be augmented; If it drop not fast enough, the clothe may be increased, if too fast, diminished.

Early in the Spring while the weather is yet cold, I intreat you be cautious in watering the leaves of the young and tender plants, only wet the ground about them when your plants or

seeds are more hardy and the nights yet cold, water in the fore-noons: but when the nights are warme, or dayes very hot, then the evening is the best time.

Plant in wet, and sow in dry. I do not mean over wet or over dry. Withall let them have good Air, which conduceth much to their health and life, without which nothing can live.

*John Gordon Haddington*

### CHAP. III.

#### *How to propagate and order Forrest-trees.*

**O** Mmitting here the distinction of species, (having confin'd to one chapter) I shall speak briefly, yet I hope plainly of their Governement, thus:

Albeit the most of Forrest-trees may be Increased by Suckers, Layers, &c. Yet if you desire Trees worth your while, Raise them from the seed. Therefore prepare a seminary or seed-plot together with a nurserie well ordered and handsomely made up in beds, as in part 1. Chap. 5. sect. 2. and there sow and set your seeds and plants in their respective seasons; keep them clean from weeds, and water them when need is: also Earth up and dible in these cast up by the Frosts, as well as shade and shelter in time of necessity. Let them stand some but one, others two years in the seminary after they rise, then remove and plant in nurserie, a foot one way and half the other distance, or 5 Rowes in the bed (if 6 foot broad,) in straight lines, having fitt prun'd their Roots, especially topped the main Root that runs straight down; so shall they send furth syde or feeding Roots, and agree well with transplanting thereafter. Also proportion the head to the Root by pruning up the side boughes, reserving some smallest afterwards all the way on the body, to stop the sap in its course, that the Tree may grow great with its height, and this will prove the best fortification against the winds.

Cut

Cut not the tops of these Trees you ordain for Timber, except some grow crooked in the nurserie; these save Greens may be sell'd near ground in the Spring or at midsummer, and train up the streightest shoot again to be the Tree. When they have stood 3 years at most in this nurserie, replant them at a wider distance in Spad-bit trenches, 3 foot one way and two the other, where they may stand till they be ready for planting out in your Avenues, Parks, Groves, &c. Which will be in 3 years, if thir Rules be observed. But if you think them yet too small for setting out, you must transplant at a wider distance, and at every remooval Top all their Roots with a sharp Knife, and thin the side-boughes for lightning the head: but do not prune up all, as is the Custome of the ignorants, whose Trees are so long, small and top-heavy, that they cannot stand; but of pruning more hereafter. If you neglect this transplanting and pruning the top Root, while young, your essayes to do it when old will prove ineffectual, nor will they ever be worth the while.

All the time that your Trees remains in nurserie, and at least the first and second year thereafter, be carefull to cleanse them from Weeds and Suckers by delving, hawing, &c. The advantage here shall soon counter-balance the cost.

Choice your Seeds from the high, streight, young and well thriving Trees; and the fairest, weyghtiest, and brightest thereon: for its observed that the seeds of hollow Trees (*i.e.* Trees whose pith is consum'd) doth not fill well or come to perfection, as *Langford* sayes of Pears, concluding that the Kirnells of Fruit depend much upon the pith. And I bid you reject such as was never set by art, as Peevish parents for Children, that must be thus accommodat with uncouth lodgings as well as dyets in their travells: Its a mischief in many people that accompts all ridiculous, that they have not been bred up with or accustom'd unto, so with Trees in some respect.

2. As for the Oak, the Acorns we get from \_\_\_\_\_ puts furth a lustier shoot than ours; nor do I approve of them in natural woods, they ripe beginning *October*, gather them in a dry day, and lay in some open Room to dry a moneth, turning them with a broom, then lay

lay them in a couch dry sand till latter end *February*, dible them in the ground 2 Inches deep, 12 rowes in the bed, (if 6 foot broad;) they come up the same season, and although they will grow on any ground, yet they grow better on the best, that is a good loamy Earth. Order them as is directed in nurserie.

The Elm that growes with a clean and taper body is best worthy your care. we have extraordinary clean and smooth barked Elms from *Holland*: but I think they take more paines in preparing and making their Earth fine, which certainly is most conducible thereunto. Their Seed falls beginning of *June*, (tho it doth not fill every year) when they begin to fall, gather them and spread on a Clorhe a little, then sow them immediatly promiscuously over the bed, and very thick covered near an Inch of Earth; I had them come up within 10 dayes: they love a light Earth something moist.

The Ash seed is ripe in *November* and *December*: having spread them a little to dry, put them in a hole *stratum*, *superstratum* of Earth and Seed; take them out at Spring come twelve moneths, and sow as Elm, for now they rise; and loves a tender soil not too moist.

The great Maple, commonly, but falsly called Plan, its seed is ripe in *September*: sow it at Spring it, comes up that season: affects a soil with Ash or rather better.

The smaller Maple is rather for Hedg, its seed lyes as Ash.

The Beach seed ripes the end of sept: but it fills not well every year, nor ar we so very plentiful of old trees, as could be wished: for that cause we send abroad for seed. as soon as it comes to our hand, it may be sowen, or rather keept in a couch of sand, as the great Maple till the spring, for it comes up that season: affects a light soil, no clayes.

The Walnuts, and chestunt, albeit they be fruit trees, I plant them without the orch: walls, their nuts ripes beginning of *Octob*: when they begin to fall take them off and rub off the outward husk, but do not weete them, then order them as accorns; they come up the first  
sea-



season and affects a hight loamy earth. I could wish for more horsechests their seed from turkie.

The black cherrie or green is a tree that I love well in Avenues and thickets. there is a sort at *Niddrie-castle* where I was born 7. miles west from *Edinburgh*, whose fruit is preferrable to any cherrie: I take it to be a sort of heart, but it's a great bearer; (which propriety the heart cherrie wants) they are best stocks for standard cherries. learned *Evelyn* and Ingenious *Cook* takes notice of this tree.

Gather their fruit when full rip, the beginning *August*, eat of the fleshy part i. e. the fruit, and lay the stones to dry a little, then lay them by *stratums* with earth, which prepares them, if sow'd at spring to rise that season, otherwayes they ly till the next: they affect a light, sharp soil, and if you may, mix it with compost; and then it shall be for cherries of all sorts.

The *wild Service*, commonly called *Rons-tree*, their fruit ripen in *Sept.* which you may eat or Rub off by rolling in sand; then prepare & sow them as cherrie. They love a moist Ground or shade not wet, if you will plant them in better soil in Avenues, me thinks, they would be very pleasant when spread over with their umblefashion'd, bright Red fruit.

The *Line or Lidne* tree, commonly called *Lym*, the broad leaved with odoriferous flowers is best. the seed ripen beginning *Octob.* But fills not well every year with us, and indeed we have few come to any considerable perfection; yet I have seen them bear seed at *Hamiltoun*. it should be a little dryed in an open Room and couched in moist sand till winter pass, and then sow'd in a little shade, for they must not be too much exposed to the scorching Sun: they come up the same season; but if not prepared through winter, they lie till the next. they love a fresh loamic earth (& in planting them I advise you to cover the surface of the earth about them with leitter topt with earth the first year at least.

The *horn beam* may be ordered as small *maple* they like a dry stiff ground, they are copsis.

The *hassell* and *filboards* seed or nuts is used as wallnuts, they de-

light in dry banks, nor are they stately Forrest trees.

The Birch is a proper tree for much of our poor, dry and barren grounds: I never raised any of them by seed in the wood, they are so plentie by suckers. *See*. Many of which handsome trees I have planted succesfully.

The Beantree soil vulgarly called peascod-tree, its seed ripens in *Oct.* and being kept dry all winter, sown at spring comes up that season, and affects a moist Ground but sweet.

The white poplar vulgarly called *Abele*, its a quick grower and pleasant tree, so is *Aspen*; they are easilie propagated by cuttings; so the last by suckers, see *chap. 1. sect. 5.* They love a good soil something moist.

The *Alder* is so propagable and loves the marshes; and so is

The willowes, Sallows, and oziars, they all affecting a moist ground and must be so kept till Rooted.

But I come to greens; as

The Pinetree and pinasters whose husks you may expose to the sun till they open & seeds fall out, to be sown in *March* but if late ere they come home (they requiring the summer sun to open them) if you then sow, they cannot get strength sufficient to withstand the ensuing winter; therefore keep them in dry sand all winter, and sow them in the spring; For they rise that season wherein they are sowed, they love a good and tender soil, they are something tender while young, (as all greens are) the great Pine is tenderer than pinasters, and nice in transplanting. therefore observe the Rule in *chap. 7. sect. 2.* Shade and shalter in both extremities of heat and cold while young. But non so proper for us as

The Scots Firre, many one of their husks have I gathered any time between *Jan:* and latter end *March*, lay them on a Cloth to the Sun which opens them, to be sown latter end *Aprile*, they come up that season, and loves a soil with *Pinus*. See how to order in nurserie: for they must be dibled in again the first year, as spued up by frosts; they or any Tree will grow on moist sorts of grounds if well ordered, and prepared and secured from drought  
the

the first year. And therefore help the ground where its not to purpose, (they will pay you or yours for your pains) as if you plant in gravelly or dry sandy ground, mix it with clay and turfe a large distance round about the Roots: or if in stiff and moist clayes, trench 8 or 9 foot on each side round the compass of the Roors, adding small gravel, fatt sand, &c. And plant ebb: but enough of his in the last Chapter.

The silver Firre is so ordered, only its tender while young, and subject to blasting.

The Pitch Tree (as common Firre,) its a hardie Tree, and no wonder, seeing, as I am Informed, it growes by nature plentifully in *Norraway*.

The Yew is also a hardie Tree, only requires some defence while young, their Berries ripen in *Novem*: Rub off the flesh or clammy substance, and lay them to dry a little, (but not at the fire) then box them *Stratum Superstratum* of earth and seed, placing them in the shade till the spring come twelve moneths; at which time sow them, and then they spring, affects a good soil, not stiff.

The *Holly* is to be used as *Yew*: for they ly as long; its the most proper for hedges of all the plants in the World. Next thereunto, is the *Hawthorne* (tho not a green) whose seed ripen in *Octob*: and to be used as *Holly*: for it riseth not till the spring come twelve moneths; and the better you prepare and mix the ground with Rotted dung, the larger will they shoot. Nor let any Imagine, that *Holly* also loves not dunged ground, nay, (say they) poor and gravelly soil; but I know the contrary by experience.

I shall speak of some shrubs in Chap: 7. for I must leave them here, and come shew you how to transplant and prune the stately forest trees.

3. In Transplanting remove with earth about their Roots (if you can) especially greens; at least take all the Roots up a good distance from the stem, by making a Trench round, and be not hastie: then top all their Roots with a sharpe knife, (stop tending down as a horse foot) cut off all the bruised and broken parts till you

come at firme wood, top the small Roots like hair, to make them stiff, so as they fold not, when the Earth is put in, and rott thereby: proportion the head also to the Root by thinning it, prune side-boughs; (reserving allwayes some for tapering the Tree) these you cut, do it close and smooth by the body, slanting upwards, and they will soon overgrow the wounds, if the branch cut off be not great. Cut not the tops of *Oaks*, *Beaches* they cannot endure it, neither any Tree that you ordain for timber; albeit I have been necessitate to lop great old Trees, whose heads could not otherwayes be conform'd to their Roots, which necessarily ar diminished upon removal. But this is not the case of well trained Trees in a nurserie.

The Rule for removing old large Trees out of woods or other places, who was never before Transplanted, is to make a trench at two sides of the Tree, distance considerable, till you can Inforce the Tree upon on side: then cut the top Root through, saving as many collateral Roots as you can; lessen its head, or lop it if it can suffer, and so set up the Tree again, and tread in the earth about it, as it was; let it stand 2 years to emitt fibres or feeding Roots to nurse it when Planted out.

But to my nursed trees again. When you remove, as is directed, carry them as quickly to their new quarters as you can; let the soil where you set them be as *Connatural* to the nurserie as possible, see the last *chap.* for preparing grounds and see part 1. *chap.* 3. and 4. for the orderlie wayes of planting.

The best way is to make the holes a year before you plant, and in summer stirr and turne their earth, that no weeds grow thereon: make them betwixt, 12. and 18. Inches deep, and betwixt 4. and 8. foot diameter, if ordinarie trees: but if the ground be bad and not proper for the trees, then trench, mix & apply, till such become more agreeable.

When you plant, lay the surface in the bottome and fill up the hole with fine earth, till it can only admit the upper part of the root to stand level with the surface, (this is not to plant deep, for they that do;  
but

but cheat themselves) then set on the Root of the tree in the middle of the hole, and if no earth adhere to the same, make a little hut in the middle of small earth, and lay the roots right spread round about with your hands that nonly folded or disorderly, then put in fine small earth amongst the roots, & shake and move the tree, so that the earth may go in amongst them till no cavity or void be left to let in the air; such roots as folds raise up and level in their wonted posture with your hands shovelling on more earth and tread gently, then fill one more and tread well with your heels till it be as farr filled up about as it stood in the earth before, make the bulk about level on the top, and just the breadth of the hole, and it will be about half a foot above the surface if ordinary nursed trees and good ground. you may put on the rounding string to make its edges circular and handsome, or if you will to make it like a geometrical squair, then streight lines from side to side of a thicket will make up the bulks that the whole will appear as walks and borders two ways: lay new horse dung and leitter or ferns above the bulk (so as it touch not the stem) covered with a little earth to keep it from drying, the Rains will wash in its substance and refresh the Roots, besides it keeps out summer drough and winter frosts.

The first year at least go through, now and then, and tread them right after winds. I am not for staking trees (but for training them so as they may not need it, except you drive three stakes about each tree at the our side of the bulk, then the double straw Roaps tyed from its body to all the three stakes will secure; and if you fasten cros sticks briers and thorns, here shall be a fence about each tree. Rub off buds that offer to break soorth near the Root or any place where you would not have them, (but still leave some here and there on the side to stop the sap from running too much in head) keep them clean of suckers & weeds by hawing in summer, & delving & loosening the mould about them spring and Autumne *i. e.* at the two equinoxials, and tread fast again, as tearing drough and winds.

Observing is what is said, you may expect monamental, clean and well thriving trees, if right pruned and well Inclosed.

The time of planting, see season for off sets Chap. 1. Sect. 4. neglect not your time of early planting, that is, as soon as they give over growing, and before the frosts come on, and you shall see them farre out-strip these set in the Spring, though have often planted in the Spring through necessity, but then I was allwayes something more than ordinary carefull to defend them from the ensuing droughts, by covering their bulks and watering, &c. Yet I preferre the Spring for Firr, and other such Greens, which therefore unavoidably requires the same care.

4. I shewed before how to prune in the nurserie while young now continue; when planted out whilest they be small, prune every year, when a little older once in 2 years, then once in 3 or 4. and never seldomer than in 5 or 6.

And as you prune up the body, till the desired hight leave small branches here and there by the way, that it may bring greatnes with its hight, and be by consequence the more able to stand; let never a Tree get a greater head than its Root is sufficiently able to nurse and bear; neither be Rash in loping them, except they be already top-heavy, which brings crookedness; if so, cut at a crooked place, slanting upwards, clean and smooth, and train up the streightest shoot again to be the Tree: or rather if you can save its head by thinning and cropping the branches on that side which leans *i. e.* the underside, thus at midsummer, and slit the Bark in the Spring, so may it grow streight and taper. Purge still the head when needfull and prune superfluities, cut off all that Crosse, Rubs, Frets, and Galls on another. Permit not Trees to Fork, train them with one streight and taper body, and a handsome round Pyramidall head. And when you prune, cut close and smooth by the body or bough with the Knife, or Chissell and Mell, or if the branch be great, cut with a saw (nicking it underneath first) and smooth it with the Chissell, so will it the better heal: but if the Tree be very old and the branches great, such will never be able to overgrow the wound, therefore if you must cut such, do at a little distance from the body, the wound declining the Horizon. Thus Train pines, Firrs, Pitch, and these of the Conicall Tribe in stories only (which methode



methode they naturally follow, you may cut out some of the greatest branches of the under storie, but so as you leave them regular or equally furnished round: so may you leave one storie, cut out the second, leave the third, &c. Cut not their tops, yet you may crop some of their side-boughes if the Tree be top-heavy, and afterwards as the Tree gets footing, cut these clean off.

There be two seasons for pruning such as lose the leaf: the first for these of little pith is *October* and *November*, or any time in Winter: and for them of soft wood and great hearts, and for Greens let the frosts be over, and before the sap in them rise, except Firrs and other Rosinious Trees in *November*, because if pruned in *March* they bleed, and in *September* and *October* they have not given over growing.

The second time is midsummer, which is ordinarily about the end of *June*: this is a safe time to prune them of great pith and any that is unapt to bleed; but especially for cutting of young shoots of this year: extirpate all such buds and shoots as you desire not to grow, and hereby you may make clean bodied Trees, albeit never so apt to break out in Side-boughes, as some Elms are. for the diseases of all Trees with their cures, see Chap. 5. Sect. 8. and 9.

## CHAP. IV.

### *Of Hedges, or Inclosures.*

1. **A**S there is no Countrey can have more need of planting than this, so none more needfull of Inclosing: for we well know how vain it is to plant unless we Inclose.

I spoke of Brick and Stone Walls, in Part 1. Chap. 5. Sect. 5. Now for Hedges I preferre the Holly and Hawthorn, raised from the seed, albeit there be several others. mix not Hedges, because strong-

strong-growers over-growes the weak, neither suffer Briers, Brambles, Docks, or Thistles therein.

2. Your *holties* having stood two years in the seminary and two in the nurserie, remove them by atrowall or a spade with a clod of Earth at their Roots, cropping such Roots as appears Without the clod with a sharp Knife, and lessen its head by cropping the side-boughes, (cut not its top) plant in made up bordures, or at the back of Ditches at a foot distance in good earth. Let them stand two years untouched except weeded, then cut their tops at a bud to make them furnish thick, and ply their side boughes to grow through other, like slicing or feathering, and next year fall to work with the Sheers, cutting both sides and top as we use to do with Box, &c. Never supporting or binding any Hedg, as is the Custome of some: plant your *holties* in *Aprile*, and when ready for sheers, cut in *May* and *July* therewith, and so train them close from the bottom, but neither too broad nor too high.

3. The *hawthorn* having stood 2 or 3 years in the seminary, pull them up and cut the ends of their Roots, and their tops within 4 Inches of the Root, and plant them within the fence or back of the ditches in the good earth, delve them in spading by spading all alongst two rowes, a foot distance, standing in equilateral Triangles, still thickning your bordure by adding good Earth &c. Let them stand 3 years untouched, except weeding and repairing where any is dead; then fill them within half a foot of the ground, so will they shoot furth a thicket of young shoots, which next year may be train'd with the sheers, as before is instructed.

4. If you would Plant your hedge on the face of a ditch, as in wet and tough grounds, then stretch a line at both sides of the intended ditch, and ritt with the spade alongst by the same, slanting inward: for if the ditch be 7 quarters wide, it must be 5 deep, (sloping to a foot in breadth at the bottom) then cut the turf or surface of your ditch, and lay a gang or row of the first spading alongst by the brink of the ditch (sloping at the face according to the slope determin'd, with half a foot of table intercepting, because so much

much will crumble down by the frosts, &c.) On the top of that, lay one row of quicks, their tops standing up a little towards the ditch, cover their Roots with fine small earth, and lay another spading above them, and if you will lay another row of quicks above that, every one here opposing the mid-intervall of the other, and so cover on the rest of the mould till the ditch be finished: being all-ways sure to put good earth next the quicks, tho' you should bring it from some high-way or ridg of land next thereunto, and every year scour the ditches, claping it up about the quicks. or a farr better way is,

To cast half of the Earth that comes out of the ditches, to each hand, and quicks in both sides; accordingly this will make an Invincible fence: for then the hedg growes up on both sides of the ditch, the gutter betwixt makes it terrible. but that I am against the common double, (which is 2 ditches near other, and the Earth that comes out of both laid betwixt them, with a row of quicks in the face of each ditch,) is because here the quicks are obnoxious to the cropping of cattle; (besides they take much ground and the quicks are too much burthened with Earth,) rather if you be for such, make a little space betwixt of plain ground, where you may plant the Hedg.

5. But if you would have a row of Trees round by your ditches, then make these two ditches the breadth of a walk sundrie, but parallel, and in that mid intervall plant one single row of Trees, and the two hedges at the Back of the ditches: here you have two excellent walks of shade, nor is the ground lost between thir hedges; you may have good Hay, and in large quantity. And in effect this is the best way that ever I thought upon, for Inclosing and sheltering our grounds and plantations; and you may make the Intervall betwixt these hedges wider, so as you may have two rowes of Trees.

6. Now for fencing the quicks in all the several sorts from the cropping of beast, as indispensibly necessary while young.

If the Hedg be planted alonght by the back or inside of the Ditch, then the streng Ditch with its Earth casten to both sides will fence it: and if you think that not sufficient, set, stake, and raise Hedg on the top of the bank, or rather (which is indeed much better,) cuttings of Thorns set there in a spade bit trench well backed: or for want of these, back up the Ditch with Turf, which is like half Ditching. But all this time there is but one side of them fenced, and that next the pasture; therefore no beasts can come on the other side to eat the Fogage, except reathered horses: but if you make the hedg or Hedges and Trees betwixt the two Ditches (you may cast half of their Earth to each hand, and back them as is Said, which fences from all hands most elegantly. And if you plant your Hedges in the face of the Ditches, the same backing on each hand will also fence them.

But where you plant Trees at a great distance through your fields or parks, you may fence every particular Tree by cutting a little trench round 4 foot off the Tree, and about 2 foot wide, facing it handsomly up like a ditch, laying one row of Turfs or spadings above other, till it be 3 foot high from the surface, backing them with the small Earth or shovellings, battering inward to the Tree; here the Tree must be high planted: tho more the Soyl inclyn to wet, or the sourer that be, plant so much the higher above the surface; you may stick some Briers, or Thorns on the top of this Tump.

## C H A P. V.

*How to propagate, and order Fruit-trees.*

1. **T**HE only Fruits for this Countrey are Aples, Pears, Cherries, Plumes, (and Apricocks, and peaches at South-side of walls,) Currans, Goosberries, Rasberries, &c.

Before I begin, I shall premise some observations on Graffing, &c. a sure means to obtain Fruits of the desired species, and that in short time: for by taking the twig or bud of such a sort as is a good fruit, and bears well, and Graff or Inoculate into a proper stock, you are sure to have the same fruit; because the Graff dominates, albeit it may have a little smack of its stock whereon now Graffed. And you may expect fruit, because it may actually have the fruit buds, as being taken from a bearing tree. But if you sow the seed, they will be long ere they come to bear, and at length perhaps bring no fine fruit, and for the seed of Graffed Trees, they will not bring the same fruit; Pears, and Aples will rather bring a Fruit of the nature of the stock, whereupon they have been graffed; and although you should take a Cyon of the same, and graff in its self, that will not alter the Fruit, nor better the Tree, except a little check its aspiring, which may as well be effected by pruning.

Wee can also be sure of the desired fruit, by cuttings, layings, and circumposition; but such are allwayes Dwarfish and short lived Trees, as wanting a main Root which all seedlings have. Hence ariseth one reason, why stocks should be raised from the seed. Suckers are not so clean and lustie; therefore not so able to nurse the graffs, and they are apt to send Suckers again. Only I look upon plum Suckers as very good, because when they Spring off a Root at a distance from the stem, they strick good Root of themselves, very much resembling seedlings. Moreover you may

graft on a Root or a stock Sprung off that Root as in Chap. 1. Sect. 4. & 8. which is near equal to a seedling.

The seed of crabs, or wild Aples, and pears, may be fit to make stocks of such Trees designed for the fields, or more Rugged grounds; but for a cultivated soil I would choice the seeds of finer fruits. And so the great White-plum is the best stocks for Apricocks, or for want thereof any other White-plum with great shoots, albeit it doth on any plum: but we reject it self for a stock, as being too spongie and not so durable. But Peaches and nectarins, takes only best upon Peach stocks, so cherries on geens, and Plumes upon plumes.

Goosberries, and currans, needs not grafting; they do well by Suckers, layers, and cuttings.

To make Dwarfse Aples, Graft or bud on the paradise or any that hath Burry-knors, Codlings, Redstracks, &c. Dwarfse Pears on the Quince: but no Pear holds well on it (that I have tryed,) save Red Pear Achans and longavil; but you may re-graft for varieties. And if you be very curious for these stocks (which I am not) you may cut them at the Spring, when ready for grafting, within 2 Inches of the ground, and at *August* come twelve moneths Inoculate in that young shoot, and perhaps they will prosper the better. but I think grafting in the Roots of Pears, will produce Dwarfs.

Dwarfse-cherries on the morella, or on the common Red cherrie. Or on that Red geen spoken of in Chap. 3. Sect. 2. which is more Dwarffish than the black.

2. The mellow, warme and light ground is for fruits; and although the best, warmest and lightest land, yields most excellent corn, yet the strong, stiff, cold, moist yields not so good fruits, plants, Grasse, Hay, &c. Aples affect a pretty rich loamy soil, tho they will bear in clay mixt with lym, dung, and Turff.

Pears will prosper well enough where the soil is mixt with Gravel. But both Aples and Pears are better relished in warme grounds that are not over moist, than in cold and wet: yet there be some grounds hath sweet moisture, others soure; Which last is very bad, and



and therefore must be helped by draining and application of proper Medicine, see Chap. 2.

Cherries, Plumes, Apricocks, Peaches affect a light, sharp soil thoroughly prepared and mixed with Rotted manures. As to their propagation,

By Grafting are Apples, Pears, Cherries, Plumes, Quince, Medlar, Wallnut, Chesnut, Filbeard, Service, &c.

By Inoculation or budding at Apricocks, Peaches, Nectarines, Almond, Goosberries, Currans, Apples, Pears, Plumes, Wallnuts, &c.

By Suckers, are Currans, Goosberries, Barberries, Rabbies, Quince, Vine, Fig, Mulberrie; its the white that feeds the Silk-worme: But that's to little purpose here.

By layers and circumposition are all sorts.

By cuttings are Currans, Goosberries, Vine, Quince, Apples, especially these with Burrie-knots.

By Nuts and Stones are Wallnuts, Chesnuts, Filbeards, Almond, Peach, Plum, Cherrie.

By Kirnells or seeds are Apples, Pears, Quince, Goosberries, Currans, Barberries, Vine, Mulberrie, &c.

I have told whereupon to Graff Apples, Pears, Cherries, Plumes, Apricocks, Peaches; and as for the Quince you may Graff it on it self or on the Hawthorn, Almonds on it self, Medlars on Pears, or on the Service, Filbeards on the Hassell; Service, Wallnut, Chesnut, Goosberrie, Curran, all on their own Kind.

3. In raising the stocks observe that.

Apple, and Pear seed, must be separate from the Fleahy substance and spread to dry a little especially the Cyder-marie, lest it heat; you may roll it in Sand to help the separation: keep it in a couch of dry Sand till Winter pass, then sow them as soon as the frosts are over; they come up that season.

For raising Cherries or Greens see Chap. 3. Sect. 2. Peach, Plum, and Almond-stones must be used in all cases as Cherries, only you may break the Peach Stones.

Use the Quince-seed as Aples. As for the rest, I have shewed how they are increased in the last Section, and how to performe the several wayes in Chap. 1.

But you must prepare a seminary and nurserie, as before for Forrest-trees, see Chap. 3. Sect. 1. sow every species by themselves, keep them clean of weeds, and the next or second year after the seeds rise, if they shoot lustily, (draw out the biggest first) transplant them into the nurserie in single rowes 2 foot intervall, and half a foot in the rowes, for conveniency in hawing, grafting, pruning, &c. and observe to prun Root and side-branches in planting, as I directed with Forrest-trees; only when you have got them to a convenient hight for grafting, you may cut their tops to make their bodies swell the sooner, albeit this be not permitted with Forrest-trees. However graff and inoculat, while the stocks are young, e're they be an Inch Diameter, and they will sooner heal the wound: let them have a years settlement in the nurserie before you graff; but you may inoculat that same insuing summer after planting, especially if they be very free and lustie. Next year after grafted, remove them to a wider distance, viz. 3 foot one way and a foot the other, Prun there Roots at every removal, and enter a pruning, that they may provide for a well shapen head, cut them near now while young, if you would have all their branches of an equal greatnes, and of order proper, as anon I shall inform you.

In setting your stocks in the nurserie, I presume you will set every kind by themselves *i. e.* Pears with Pears, and Aples with Aples, &c. And when you graff or bud, write down in your nurserie-book their species as they stand, viz. begin at the end of such a nurserie, and say the first row is grafted, with such a sort and so furth: and if you have more than one in a row, then set in a stake betwixt each species, and so write thus, from such an end of such a row; to the first stake is so many of such a sort or species; thence to the second stake so many of another, &c.

4. When you transplant Fruit-Trees into orchards, do, as I directed with Forrest-trees in groves; plant not deep, neither trench

trench too deep; but tempt the roots by baiting the surface with dungs to make them run ebb within the reach of the Sun and shoures. Therefore mix the Earth in the holes (which should be 6 or 8 foot diameter) with Rotted neats dung and Earth well turned, sweetned and Prepared as in Chap. 2. Cover, delve, and haw their bulks as in Chap. 3. Sect. 3. and for further improving and keeping your Fruit-trees in good case, see Sect. 6. of this Chapter, prune their Roots at every removal, as Forrest-trees, (experience forbids me to make exception of the Peach or any other, as some doth) And proportion their heads to their Roots by pruning: but here note, that, as Forrest-trees are train'd up high bodies and unlopt heads, so Fruit-trees with low bodies, their heads lopt and branches topt; therefore easily proportion'd, as aforesaid.

Standards of 4 years old, may be planted out of nurseries into Orchards, Wall-trees of 2 years old.

The season of the year is as soon as they give over growing; (if the leaves be not off, cut them, saving a little tail of their stalks) its true you may plant any time in Winter, weather open, but rather let the frosts be over, and the Spring Approaching, if you have missed the fore-end of Winter, which is the better season.

For standards are Aples, Pears, Cherries, Plumes, Goof-berries, Currans, Barberries, Quince, Wallnut, Chesnut, Fil-beards, Service: But I think all these deserves not a place in the orchard.

For Walls are Apricocks, Peaches, Nectarines, Almond, Vine, Fig, Currans, Aples, Pears, Cherries, Plumes, &c. But you need not take up much with Almond, Vine, Fig, nor Nectarine

On the south side of the Wall plant Apricocks, Peaches, Nectarines, Vine, &c. On the east and west sides Cherries, Plumes, Aples, Pears, &c. On the north side Plumes, some Pears, as great Bargamor, some Aples, Currans especially, and Raps, &c.

When you elect them in the nurserie, hang sticks tyed at them  
figured,

figured, and write the same figure on the Paper at their name to distinguish their species; and afterwards being planted write them, as they stand.

5. Begin betimes to prune your Fruit-trees, spare them not while young: reduce them into a good shape, and order while such; so will they not only Soon over-grow the wounds, their branches being but small, but also when they should come to bear fruit, you shall not need to cut so much, only purge them of superfluities; and this is the way to make Trees Fruitful as well as pleasant.

Some Ignorants are against pruning, suffering their Trees to run and Ramble to such a head of confusion, as neither bears well nor fair: for the Root is not able to maintain such, farr less fruit too; and therefore are their fruit so small and Imperfect; in the mean time the Tree spends its strength, and so cannot live long, nor make good service in their time: yea sometimes the Root is not so much as able to bear such monstrous heads; I know one windy day prostrate above half a score such in a little orchard.

Others again that are for pruning usually runs on the other extreame, by cutting too much, and untimely; and some sparing what they should cut, and cutting such as they ought to spare: but the general errour even amongst the learned is, that they spare them While they should prune, *viz*: the very first and second year in special, yea the first 5 or 6 years; and then they fall a massackering: at which time the branches being grown some of them greater than other, who now runs away with all the nourishment from the smaller; insomuch that no man can reduce them to order again, having thus neglected the time. Albeit you should endeavour it by cutting deep, or exterminating these great branches, which I confess is the next remeed; but then as these wounds brings cankers, hollownes, &c. So doth the work retard their bearing fruit. And indeed its about the time that Trees ordinarily begin to bear fruit, that these unskilful men

men begin to prune: and the more they are thus cut in the head, the more they spring out to wood, and the less fruit they bear. But experience has taught me to begin, While young.

And when you do begin consider on the hight of the body, (for as high Trees are unprofitable, so too low Trees in orchards are inconvenient) for Aple and Pear standards two or three foot, plume and cherrie 3 or 4 foot, Dwarf and Wall-trees half a foot; there cut the top that Runs Straight upwards, making it to spread out in branches round. suffer no branch to aspire beyond other in hight, nor any to cross, Rub, or gall one another; and whatever branch or twig you cut off, cut close and clean by the body or branch (except in the case of old Trees and great branches as I observed in pruning Forrest-trees) and in topping of branches cut close and smooth Immediately above a leaf bud, slanting upwards. And when you prun, spare the fruit buds (the full ones are them) except you see them too many; then purge by the Knife, likeways if afterwards you find more fruit knotted than the Tree can be able to nurse to perfection, thin them in time.

But your first work is to proportion the head to the Root, by pruning; cut the tops at a convenient hight, that the Tree may grow equally furnished round; for cutting as it diminisheth, so it forms and shapes the head, insomuch as it furnisheth with new young shoots, that may be train'd, as you please.

Standards should have but four Arms breaking out for a head, opening equally round, these divided into branches, and again subdividing into twigs. & that you may the better understand what to cut, you may stand under, go about, look up through the tree where you may espy superfluities: keep them clear, void, open within like a bell and level on the the top. make some larger opens towards the the south for Sun-beams entrance; let no branch grow cross through the heart nor shoot spring up therein; (minding alwayes to prun such as cross, Rubs and galls other as above is noted) & any branches, shoots, or twigs that grows not the way you would have them cut them at the place whence you think they will send forth shoots

O

which

which may lead the way you desire them: cut close, smooth, and slanting at the back of a leaf bud tending that way; by this I bring Trees to order.

Wall-Trees especially should be cut near, while young, that they may send furth a thicket of small shoots for furnishing your walls from the bottom, equally: and if you continue to top them every year at a convenient hight (perhaps about half a foot above the last) that will make them shoot all their branches of an equal uniformity of greatness, hight, and thickness, so that no long, bair or naked branch be seen there, neither one or two great and all the rest starved small; the common fault of our wall Trees, and is occasioned through neglecting to cut while young even the first year, as is said above.

But albeit a Tree right begun and so going on, yet one years neglect or wrong pruning may spoil it: for as I was once pruning wall Trees, an Ingenious person standing by, said I cut them too low, alleading thereby, the wall should be long uncovered, desiring me to cut them a little higher: I told him, that was wrong, but for to satisfie him I did cut 2 of them about 8 or 9 Inches higher than I designed or should have don. The next year these two Trees left about a foot naked round, and above the same crown'd like nests while the rest was equally and orderly furnished; when he beheld this, his minde was changed, and I ob-leidged to cut exactly where I should have don the precedent year: which was now a little below the middle of the naked place, and this did put them several years behind the rest of bearing fruit.

You may nail them at midsummer that year of planting, and so continue to do at the seasons hereafter discribed: prepare double plancher-nails and tags of hats, (which is better than leather) shape the tags about half Inch broad, and betwixt 3, 4, and 5 Inches long, making a gash with the Knife near the ends by folding, to put through the nail; then spread the Tree, laying, plying, & nailing every individual branch by it self, all at equal distances from other, not close in one place and wide in another, and.



and let non cross other, the superfluous and these that will not ply easily, and the exuberant or lustie that Robs the rest, must be cut away.

Well plyed Trees will appear like apricocks; train, spread, except these on a low wall, which you may cause lean all one way, as half of the other: drive the nail but half way in, and on the upper side of the branch, else it will lean and gall; at every nailing alter the old nails and beware of pinching tags, &c.

The time for pruning old planted and hardie Trees, is any time betwixt the leaf falling and the Spring, but let the frosts be over before you prune the new planted young and tender, and before the sap rise, otherwayes the frosts will penetrate the wounds and make a sore: but if you must cur before the frosts, because their heads may be obnoxious to the winds, (such are ordinarily the new planted standards) then yow may cut a little, and at Spring cut off these pieces left cleanly, as before is noted. Also let the frosts be over before you prune your Wall-trees and before they bud; only I use to let peaches bud furth a little e're I prune them, otherwayes pieces of their branches sometimes perish after the Knife.

And besides, that you must Rub off all unnecessary buds, and pull up suckers and weeds from the Roots, you must also give all your Trees a midsummer pruning, (which is ordinarily the end of *June* & beginning of *July*) a good time to cut any shoots of this year; any shoots or buds as tend not only to the deforming your Trees, but Robs them of that sap, which may be otherwayes spent in nursing the Tree and its fruits, (but the Spring is the time of cropping or cutting their tops untill the wall be covered, then crop at both seasons) thin & purge gently to let in the Sun, but not to scorch the fruit. this is also the time of furnishing your Trees with pedestools or Bearers: therefore in re pruning, save as many of the like shoots, as ar well placed, and cut them at the 3d or 4th bud from the Tree; but cut quit off the lustiest and greatest of this years (which Ignorants do spare) & nail up such as are for filling up the defects of the wall.

You may go through them in harvest and purge the fruit of superfluous leaves which hinders the Sun: but do it so, as there may be leaves sufficient to screen the fruit, and cut quit off the lustie shoots of this second Spring, that Robbs the Tree and fruit.

As for goosberrie and curran standards, train them to a foot stem with a handsome round but thin head: these at Walls half a foot stem with a well spread head supported with Rodes layed crosse, fastned with nails and tags. Rasps may be in shadowy bordures or beds a foot distance, kept clean of Suckers, weeds, and dead wood.

But because some years in some places we have ripe Grapes, especially that we have under the name of Frontinac: therefore if you think a Tree or two of them worth your while, plant them at a south Wall in a pure and fine mould, not wet, sour, and croud, but a light sweet soil mixt with some Cowes dung Rotted in heaps with the mould. Plant ebb and trench not deep; prune them every year, prune low in *February*, and at the true midsummer. Cut off the lustie young shoots and tendralls with sheers betwixt the 2d and 3d Joynt above the fruit; and in *August* purge it of superfluous leaves, but reserve so many as may screen the fruit a little.

There be some sorts of Fruit-Trees that will blow and bear themselves to death, when young or middle aged: For such cut most of the blowing buds, and thin the head to make it shoot again.

I got some cherries and other stone fruit from Holland, who rooke this decay: wherefore in the Spring I did cut off the blowing buds, and the branches near the place where the Tree headed, reserving only some buds for receiving the sap; (in case they should have put forth at the middle of the body or a little above ground) this made them shoot to wood. Therefore I conclude that by this and delving about, you may help ill-thriving Trees.

There be also some Apples and Pears, that will be full of false bearing buds, that doth not blow; such having got more head  
the

the Roots can well maintain, consequently has not strength sufficient to spare sap for blossoms, farr less for fruit, which by pruning and thinning the head, and by slitting the bark of the body in the Spring, may be made afterwards to bear well, when they have put furth new shoots at the head.

Some Trees there be that will not bear of themselves till they be old: but if you cut off the head of the shoots as soon as ever the Spring shoot is over (which is at the true midsummer) and take out some great boughs then, if you minde your time, and do it with discretion, you may force that Tree to put furth blowing buds, and blow and bear the year following, as I shall informe you in next sect: but,

6. One main business is to inclose your plantations: avoid planting too deep, too dry, too cold, too moist, and guard your Orchards from winds by planting two rowes of Forrest-trees, at least round without the Wall, the breadth of a large walk therefrom with Thickets of the same on the West, North and East, but especially on the West. (Yet mind regularity) also observe my methode of planting, and pruning and ordering their bulks of 6 or 8 foot Diameter: but when the Tree growes old and their feeding Roots farr abroad, you cannot reach to feed them with dungs in this narrow Compass; therefore enlarg it, or otherwayes confine them a little sooner and hinder their too farr gauding, by digging a Circle round the Tree perhaps 8 foot Diameter, and cut all the Roots clean off there, that hath run out, applying fresh and sweet Mould, so shall they emitt Fibres or feeding Roots in thicket, which may be supplied with refreshments once in two or three years, as shall be required. And this cutting the Roots will cause Trees, that are apt to spend more in wood than Fruit, alter therefrom, (add this to the latter-end of the last Section) and the ends of the Roots cut off, and their buttends raised up a little, will serve as stocks to Graff upon.

When you would enrich your worne out plantations, if the ground be poor and dry, add well rotten dung prepared and mixt with soil. The Water that soaks from a Dung-hill is excellent: for it will

follow the Roots and Enrich the Trees. If the ground be cold and moist, add Pigeons dung or Ashes and soot; which is also excellent if it be leopared with unskilfull dunging, or by noysome weeds that grows about such Roots, (where the owner is a sluggard) & hatches or nests, moles, mice, toads, &c.

If you observe the premises, you may prevent their diseases, such as illthriving, &c. But if you have, or do neglect, and the diseases be come, as if Cankers or Galls be entered, cut them clean out, covering the wound with a Plaister of Cowes dung and clay compound; if the bark be pilled by hares, conies or mice, apply a Plaister of the same; (but better prevent the last three, by swadling the Trees with Straw or Hay ropes, unloosed in summer and renewed every Winter, if your fence cannot Guard them.) Illtaken off branches, broken or rotten branches must be cut off clean and smooth. If any Trees be bark-bound, (which is the misery of many and especially Forrest-trees) slit them in the Spring through the bark on both sides with a sharp Knife from the head to the Root, and delve about them, otherwayes raise and plant ebber if too deep; which is the common cause of this disease together with bad inclosure.

If Jaundise, cut off the diseased wood; if moss, scrape or singe it off: but its vain to attempt the cure untill you first remove the cause; which you will find to proceed from some malignity at the Roots, whither the disease be Bark-binding, Cankers, &c.

And this most commonly by ill-planting, (and not inclosing) as among Clay, Water, impenitrable Gravel, &c. Water must be drained, it an intollerable evil. Cold clayes, stiff and hard soil must be trenched and mixed with dungs and soils, often stirred and fallowed, as above is directed. And if you would have Trees to prosper, observe their nature, and wherein they most delight; and so apply and help them accordingly.

9. And for destroying of vermine, there is traps for Moles of several forms, besides you may watch and delve them up with the Spade. And for mice, the traps from *Holland*, or for want thereof, Pots sunk in the Earth (where they haunt) till their mouth be level with

with the surface half full of Water covered with a little chaff where in they drown themselves; and so doth Toads, Asps, &c. Cast away the Earth where the ants lodge, supplying its place with stiff clay: Place Cow-hooves for the woodlice, and erwigs to lodg in all nighr, and so scald them early morning. Pour scalding Water in the nests of Wasps, and hang Glasses of Ail mingled with Hony, where you would not have them frequent.

Dash Water on the Trees for Caterpillers, by the Stroups we get from *Holland*. Gather Snails and Wormes, shoot Crows, Pyes, Jayes, and spread Nets before your Wall-Fruit for their preservation.

See the Appendix how to gather and preserve Fruit, and how to make Cyder, &c.

---

## CHAP. VI.

### *Of Fruits, Herbes, and Roots for the Kitchen.*

F. **A**LL the Fruits whereof I spoke in the last Chapter, are for the Kitchen or Table, but they grow on Trees or Shrubs; yet there is some falls in here, the tenderest whereof are

*Melons*, and are not worth the while: for you must raise them on the early Hot-bed (the making whereof is in Chap. 2. Sect. 7.) which (when fit for seed) prick 4 or 5 in together, at 3 Inches distance, through the bed, setting drinking Glasses on them at first, and cover on the matts over the whole carefully, to preserve from Snow, Rains, and Winds; taking off the matts in temperate dayes, but keep on the Glasses, except in a warme space; that you acquaint them a little with the Air, by raising the edge of the Glasses, with a little Straw on the laun side, closing it at night again. When they stand in need, Water with Water made warme by standing an  
day

day or two in the Sun, impregnate with pigeons dung, but let it be fresh and clean, conveying it to the Roots, not touching their leaves with it: if they be sown on the last described horbed *viz.* in cases, sow at a wider distance, and you need not transplant, but renew the heat when needful, and as they grow larger, cover with the Bell-Glasses, giving them Air by hoisting the Glasses, till they can endure the Sun without them, but still cover all close at night again: when they have put out runners 4 or 5 Inches long, cut off one or two joynts at the end, and when they have gathered more strength, cut off all but the prime shoots. And when the Fruit knots, nip off that runner above the Fruit between the 2d and 3d joynt, cutting still off the new ones that spring, but do not expose the Fruit to the Sun: lay tile under the Fruit: wipe the Dew off the Glasses and plants every morning, but keep the Glasses on the Fruit, and Water non now.

Cucumbers may be ordered that same very way, and so may Pompions, but they are not so tender, I have raised them without Glasses.

Strawberries are a very fine and delicat Fruit, and are easily increased, but best by the small Plants at the strings when taken Root at the joynts: plant them at any or both springs, but I find most of fibrous Rooted plants apt to be spued out of ground by Winter, if not Rooted sufficiently before. Dung, delve, mix and prepare a light and warme soil, prune their Root and top, and plant in streight lines 5 rowes in the bed, and suffer them never to over-run, but keep each stock by themselves, still taking off all their strings, (except at sometime you permit a few for increas) weed and haw among them; and in *September* cut them within 2 Inches of the ground, and lay Cow dung over the bed (reserving their tops free) covered with a strinkling of Sand; this will much improve them. So as they will not need renewing for 6 or 7 years.

Artichoks is a fine and lasting Fruit, and is increased by offlets chiefly, planted in the spring, a fat and well cultured soil, light and warme, enriched with Sheeps dung, plant in straight lines, about 3 foot distance having pruned their Roots, and cut their tops within  
half



half a foot; Water (if needfull) with qualified Water, and still cut away their under and hanging leaves, and haw the weeds as they begin to peep: when their Fruit is spent, cut them within half a foot of the ground, and delve and cover the plot over with dung and leitter, keeping their tops free. and in *Aprile* delve down the same, and extirpate them of Suckers, slipping them off carefully leaving 2 or 3 at most to each stock for bearing; And they will flourish near 9 or 10 years.

Great beans must be planted early in the Spring, as soon as the great frosts or over, in deep rich ground, 2 foot Intervall and half a foot in their rows; these for seed when full ripe, cut and bind in little sheaves and lay on Trees to dry.

Kidnes in *Aprile*, a light and warme soil, support them with sticks.

Peas that you would have early, sow in the full moon of *Novem.* if a warme place: but do not trust too much unto them. Sow in *Feb.* and hence monthly till *June.*, that you may have them till the frosts surprize: in an open light, warme, dry soil; and if they ly on the bair ground, they will sooner ripe by reflection. but if you would have them fruitfull, set sticks amongst them while young, for their tenderals to climb on; and keep them allwayes clean of weeds: when ripe, you may easily win some for seed, and sow not every year on the same plot; to change the ground, Improves them. I preferre the setting them by lines, 5 rowes in the bed, as part 1. Chap. 5. Sect. 2. make the holes nimble by the lines with a dible 1 $\frac{1}{2}$  Inch deep, and 2 Inches distance from another, or the same hand, fallowing, and put one in each hole; then give the bed a smooth with the rake head, which fills the holes and covers the peas; one pound makes more service thus, than 3 otherwayes; its soon performed, and they spring orderly.

2. Of Sallads and pot-herbes, the choicest sallad is *Asparagus*: sow its seed in *March*, good ground, and that time revoly moneths transplant into an exceeding rich and well mixed ground of Rotted dung and light Earth. you may stretch lines alongst

and cross the beds and mark with the edge of the rule; then gather little huts of Earth at the crossings, whereon you must spread the Roots of your Asparagus, two or three on a hut, but do not top their Roots, (you may perceive their poynts are like the runners of liquorish) then cover the sets with the Rotted dung and Earth, 2 Inches over, which has been lying a year in compose. They cannot abide wet grounds, and weeds will quyt destroy them: at the Approach of winter, cut their stalks, and cover their beds with leitter and dung from the stables. The winter Raines will wash in its substance to their Roots; at Spring e're they peep, remove it, and loosen the Earth amongst them with a fork, and cover them near half Inch with the mould Raked and evened; but do not tread on them. Follow this direction yearly, and in 4 or 5 years it will be excellent for cutting: cut the biggest and tenderest, and a little within the ground, but hurt not them ready to peep; the seed is ripe when red.

You may have early *Asparagus*, if you plant some strong Roots on your early hotbed; which about a moneth hence will Spring, and then dy.

Purslain may be sown on the early hotbed, it cannot endure deep Interring: sow on a fine mould like dust, and only clap it a little with the shovell; hence on the cold bed, but fat and fine soil through the summer, in drills for convenience of weeding and cutting: and if you please transplant it when 2 Inches long, reserve the early sown for seed, till their pods grow blackish; then pull and hang to dry, and Rub out.

As purslain, so lettice by seeds only, at the same seasons; (but the winter with corn fallad in *August*) they love a fat soil something moist, that for winter, more dry. Suffer these for seed to run up, and only cleanse of under and withered leaves: It's ripe when it begins to fly with the wind; pull it, and lay on a clothe, to perfect, and Rub out in a dry day.

Sow cresses at the same times. And plant

Tarragon by off-sets in the Spring.

The

The small chervail by seed, as cresses. As also  
Burnet: but it continues many years, still yielding seed.  
Sampier growes at seaside in *Galloway*, not so well in our  
gardens.

Succory and Endive by seeds and offsets at both springs; they  
continue many years.

Sorrell by offsets (some by seeds also) in beginning of *April*,  
a good fat soil, a little shade, 6 or 7 rowes in the bed, weeded  
all summer, and cut near the ground in *Septemb*: In 2 or 3 years  
replant into another place: for they soon Impair the ground of  
that part appropriate for them.

Spinage by seed only in *Feb*: and *March*, but that sown be-  
ginning *August* is most profitable; cut it beginning *Oct*: and it  
will Spring afresh. And be ready for Spring stoves; then reserve  
some uncut for seed; it prospers well in a very fat Earth, Not  
too dry.

And so doth beets, who are also propagate the same way, on-  
ly them sown at Spring are most serviceable.

Sow beet card in the fastest, and when something strong,  
you may transplant: they seed the next, not that year wherein  
you sow them.

Order burrage as spinage, its also Annuall; So bugloss: but it  
continues many years.

Marigold may be ordered as burrage, and white Arage as Spinage.

Parsly by seeds in *Feb*: and *March*, they bring furth their seeds  
next year, whereby they must be yearly renewed.

Sellery in a light fat soil, 8 rowes in the bed, as parsly; it continues  
long, yearly yielding seed after the first; & so doth smalladg & Alexan-  
der. They may be blanched as succory and Endive, viz. sellery sow-  
en at spring Transplante at midsummer in a very fat and fine earth,  
half foot deep furrowes, 3 foot between the rowes, and but 3 In-  
ches in the rowes, and as it growes up, gather the earth at its sides  
from the Intervalls, leaving the top free; and still as it growes, earth  
it up; so shall it be blanched for a winter fallad.

Garleeks and shallot by offsets in *March*, a light and fat soil, 8 rowes in the bed: I use neither cutting nor twisting their stakes, but when their fibres begin to Rott latter end *August*, take them up, and spread to dry a little, and house them in a dry room with board floor for use.

Leeks by seed in *April*, a fat soil, though something stiff, In *June* you may thin them by Transplantation: prun their Roots and tops, set them at three Inches distance, and continue to crop them till *Octob*: the french seed is best, ours not worth the while.

Onyons by seeds in *March*, a Rich, Warme, light mould, well mixt with Rotted compost, and sifted pigeons dung; give them a thin coat or covering of earth. Sow also beginning *July* for *Shibols*; its not worth the pains to win their seed.

Plant offsets of sives in spring, 9 rowes in the bed, in a rich and low ground.

Cole Flower is a fine colé; sow on the early hot bed, (for its hard to get winter plants through to purpose) sow thin and ebb, and carefully preserve them from colds while young. If you water, Imbibe pigeons dung, but touch not their leaves therewith; when their leaves ar 3 Inches broad, Transplant them into a very fat and well mixt soil; 2-foot distance, prun their Roots and tops: and if any worm knots, cut them a way, and in setting keep their hearts Immediately above ground. And all along keep them clean of weeds, under hanging and withered leaves: let them not suffer drought while young, make the water like wort by dung. if the ground and seed be good, you may expect good heads; which if you spend not altogether before frosts, (which spoils them) take them up in a dry day and ty them in pairs to hang in a dry Room for use. the best seed comes from *Candia*.

There be many Cabbages; sow the *Savoy* and such tender sorts, as cole-flowers, albeit not so tender; sow the great white and Red, the full moon in *July*, Plant them furth in *Octob*: 3 foot distance in well dunged ground: set some also in *March*; but then the gardner finds multiplicity of business, therefore its his wisdom to put as much

much work by hand as can suffer it, at least to have all his grounds fallowed before winter. you may take up and hang your Cabbages in *Novem*: as cole-flowers: but plant some of the best and hardest for seed, up to the neck; when they shoot, support with stakes and Ropes; when full, cut and lay on a clothe to perfect. But choice the middle, rejecting the lower branches.

Catch snails and worms that craws the young sprouting plants; and set nets for birds at the same time. the reason why old *Cole* is full of green worms is, dry poor ground never weeded, or otherwayes unqualified dungs and unseasonably applied. If they would trench, mix, &c. As in Chap: 2. that their ground may be clean and sweet, they shall ripen accordingly.

Common Colworts ar usually sowed at spring, planted in summer and eaten through winter, and at spring when other green herbes ar scarce you may also sow and set them with Cabbages and ripe their seeds accordingly.

3. Of sweet herbes: as,

Clary by seeds and offlets in *Aprile*; at which time you may slip and set Tanisie, Sage, Cost, Mint, Balme, Winter Savory, Thyme, Penniroyall, Wild Marjorum, Maudlin, Fennell, &c. Prune their tops and fibres, and plant in a garden soil, 8 rowes in the bed; they all continue long: but cutting their tops in growing time makes them more durable: and cut them all within a handful of the ground at *August*, that they may recover against winter. You may likewayes sow the seed of Fennell, Thyme, Winter as well as Summer Savory, Dill, Sweet Basill, &c. In *Aprile*, a warme cultured soil, ordering them as above: the three last ar annualls. If you would have sweet Marjorum early, raise it on the hot bed, the sweet Basill requires the same: sow it also the latter end of *Aprile* in a warme fat soil, 8 rowes in the bed. you may sow it in *July*, and Transplant when two Inches high, in a warme bordure at a south wall; its seed with Basill comes from hotter Countries. Sow Rosmary seed in *Aprile*, or at the same time take its slips or cuttings and twist them a little at the ends, and dible in

good soil, on a south wall-bordure: but cut not their tops, they easily root being watered in drought with soap water; you may ply it to the wall as Shrubs.

4. I am now come to Roots, they require a light Earth, deep trenched, fat sand mixt with Sheeps dung; its convenient that it be dunged a year before, because new dung makes them forke.

Plant Liquorish offets and Runners in *February*, in this soil well stirred and mixt, after which do not tread save in the furrows, six rowes in the bed, and cover all the Intervalls with leitter topt with sand, but let the plants be free: for this is to keep out drought the first summer; keep them allwayes clean of weeds and cut their stalks near winter. let it stand; summers in the ground, and in *Novem*: take it up thus: begin at one side of the plot, and make a trench, the whole depth of their Roots, taking it out carefully (not breaking it) at the face of the same, casting the Earth still behind as you proceed; then cut off the plants, to divide carefully and lay them amongst moist sand in a cellar till setting time. And because it stands three seasons you may have three several plantations; so shall you have it to take up yearly, if you plant accordingly.

Scorzonera by seeds and by offets: (that is by parting the tops of the Root) sow in the Spring, or when its seed ripens promiscuouly in the beds; it continues many years in the ground, and growes still the greater, and is in season at all times for eating, tho it yearly run to seed.

Order Carvy as scorzonera; its Roots is eaten as parsneps.

Skirrets by seeds, but chiefly by offets, plant the small sets not many in a bundle, in *March*, 8 rowes in the bed: when their stalks begin to wither, fall a spending them, and as you break off their Roots for use, lay rheir tops or sets in ground covered a little till the Spring for planting; (I cautioned you before to change the crops) these you spend not e're the frosts come, hard house among very dry sand, that you may have them when



when you will, rather as be barred from them by the frosts.

Parneeps by seed only: sow in *March* promiscuously over the bed, but thin; spend and house them with skirrets, and cut quit off their tops, lest they grow amongst the sand: reserve some of the best untaken up for seed, which will ripe the next season, choice the middle stem seed.

Beat-Raye may be ordered in all cases as parneeps, save that you may begin sooner to eat them (*viz.* as soon as they are bigg enough) tho they last as long, besides these you pickle.

Carrots as beat Raves.

Turneeps by seeds in *Aprile, May, June, July*, (the first proves not best) promiscuously over the bed, very thin and scarcely any covering of Earth. When they rise, thin them; late turneeps may be housed as parneeps and seeds reapt accordingly.

Horse Radish by offlets, and lasts long too.

The Garden Radish by seed only: you may raise for early in the hotbed cases; hence every 20 dayes with other fallading through summer, because they quickly shoot for seed: sow black Radish in *August* and *Septemb.* for winter, these seeds next season.

Potatoes being cut in as many pieces as you please providing there be an eye at each piece and planted in *March*, 5 rowes in the bed, plant not deep, neither in wet or stiff ground; spend them with parneeps, and in housing spread only through a board-floor.

Parfly is also a Root for the Kitchen, and so is fennell; I spoke of them before, only you may house some for winter.

See part 1. Chap: 5. for the orderly planting of Kitchen herbes.

5. Weeding (I think) may be accompted the most material part of Gard'nery: The learned *Evelin* takes notice of it; his directions are, weed and haw betimes, continue weeding before they run to seed, which is of extraordinary Importance both

for

for saving of charge, Improvement of fruit, and the neat maintaining of the gardens: wherefore sayes he, keep your weeds down, that they grow not to seed, and begin your work of hawing as soon as they begin almost to peep; by this means you will dispatch more in a few houres than afterwards in a whole day; whereas if you neglect it till they are ready to seed, you do but stir and repair the Earth for a more numerous crop, and your ground shall never be cleared.

And this agrees with what I had written my self, *viz*: destroy weeds while young: for when they have grown strong and got deep Rooting, they'le not only take the nourishment from the good plant, but there will be such difficulty in grubbing them out, that the good seed or plant is in danger of being destroyed; but if you suffer them to bear and sow their seeds, then (besides that they exhaust much more of the substance of the ground) you shall find the work Intollerable, for they'le poyson the whole ground, insomuch that one years seeds will cost many years weeding: and therefore prevent these things by keeping down the weeds; so shall your work become easie and gardens handsome.

In beds where hawes cannot go, you must weed with your hands on both sides, sitting in the furrow on a straw cushion, pull up the Root cleanly, taking the help of the weeding Iron where needful: but make use of the haw in all the Intervalls, drill-beds, nurseries, furrowes, tables, or pathes, whereby one will cleanse more than some six by weeding with their hands; and if dry weather, they'le wither where they ly cut, otherwayes Rake them in heaps and spread again when Rotted, or carry them to some open trench or pit, and still be visiting your plantations, that as soon as you perceive a weed peep, you may chalk it.

## C H A P. V I I.

*Of some Physick herbes, shrubs, and Flowers.*

1. **A**LL the herbes in the last chapter are physical, and having spoken to them already, I have the less to do here; however there is more, as

Garden-Rue: I use to environ sage beds with Rue; (the soil not moist, mixt with ashes not cinders) you may box bordures with it as well as lavender, or hyssop; which last is also Increased by seed, and so is golden Rod, feverfew, verven, celandin; they last many years, and so doth

Wormwoods, comfry, Solomons seal, Catmint, Callamint, Elacampan, Masterwort, wall pellitory, garden Germander, Beatony, Camomile, Swallowort, Suthernwood, Lovag, Dwarf-elder, harts-tongue, Maiden-hair, Asrum, Dropwort, Birthwort, Horbund, Spignell, Agrimony, Briony, Bearsbreach, Sea-holly, Madder, Rhuebarb, Dogmercury; all which are easily Increased by offets in the Spring, and requires to be cut a little above ground at the beginning of Autumne.

Angelica, Spurg, Scurvy gras, &c. Are Annuallys, but yield seed the second year from sowing: you may sow when ripe, or in the Spring; but if you prevent their feeding by cutting, they will last longer.

Blessed thissell, Thorn Aple, Tobacco, stinking Arag, oak of Jerusalem, &c. Yielding seed and dying the first year; therefore sow yearly in *Aprile*. The Virginia Tobacco requires the hotbed, the rest a good fat, light soil, as doth Angelica: you must not burie stinking Arag deep, sow it as purslain.

There be many more, besides multitudes in the fields, Woods, Glens, Meadows, &c. Of good use, many whereof you may bring into the garden as I have done: I forbear, seeing the order is in part 1.

Q

Chap.

Chap. 5. and the wayes of propagation in the first of this, and how to order the ground in the second. I do not approve of planting the clod with them brought out of the fields, for it rots and turns sour, and so kills the plant, (albeit you may keep the clod about it till you come home but,) then part it off carefully, prune their fibres a little, make the holes with the Trowall, and plant in a Con-natural Earth, to that of their wonted abode, well stirred and aired, which is an excellent mean that makes all plants prosper, and therefore diligently to be observed.

2. Of Shrubs that lose their leaves in Winter, the choicest whereof are,

Roses of many sorts, they are increased by Suckers and layers. the mulk may be buded on the Eglantin and set at a Wall; the double Yellow bears fairest Flowers, if you bud the single Yellow on a Frankfort, and rebud the double Yellow thereon, (I have done it immediatly on the single) planted as a Standard, a little shaded in Summer, and kept clean of Suckers and superfluous buds; and any that blow not freely may be slit at the 5 divisions of the hose.

Prune your Roses after the Flower is past, viz. before the full Moon in *October*, cut behind a leaf-bud and cleanse them of dead wood, and if you desire fair Flowers, suffer but one Stem on a Root and keep it low, and every 5th year, cut them down to the ground, renewing their earth with old Cow dung.

Jasmines, Honisuckles, Pipe-trees, &c. by suckers, layers and cuttings. See Chap. 1.

Mezerion by seed, as Hawthorn; they ly as long.

Of Shrubs that be ever green there is Box, Savin, Arbor vite, Tamerisk, Privet, &c. by suckers, layers, and cuttings in *Aprile*; a shade and moist fat soil till Rooted.

The Cherrie-bay is an excellent Green, and not very Apt to blast, there is also Laurustinus, Philyrea, Alaternus, (I love not Pyracantha,) Juniper, (I care not for ever green Oak and Cypress) all by seeds, which must be couched in Sand before Winter, and sown in *Aprile*, to rise that season except the Juniper, which lyes till the

the next : transplant the second year after they rise in *Aprile*, remove by a Trowal, with Earth at their Roots, topping such Roots as appears without the clod, and lessen the head by thinning it. See where I have spoken of Holly, for the same Rules may be observed for these to be spread on Walls, but save the top of Standards : they do all well by suckers and layers also, except Cypress and Juniper. Be carefull to defend your seedling Greens while young, from spring blastings ; yet do not choke them for want of good Air.

The Pin, Cypress, and ever-green Oak, (the last in'special) will scarce endure a removal from seminary, therefore sow them in drills 2 foot intervall one way, and half a foot the other ; and the next year after they rise, make a spade-bit trench between the rows, and work in cautiously, till you discover the running down Root at one side, which you must top with the pruning Knife, and level in the Earth as it was, cut off some side-boughes and thin the head : let them remain two years ; then remove and plant them, as is instructed.

Greens that are best worthy our esteeme, are *Scots* first for Standard, Holly for Hedges, the *Cherrie-bay* for Walls, or barren creeping jvy, which will neither blast nor seek supporting.

There is Strawberry-tree, and Tree night-shade, who are tender. But

*Indian* and *Spanish* Jasmynes, Mirtles, Oleanders, and Orange-tree yet tenderer, wherefore I am not very curious of them, yet there is severals in this Countrey has them, and are at great pains in governing them, by setting them in cases, small stones at the bottom, filled with Earth mentioned for fine plants Chap. 2. Sect. 6. at the season Chap. 1. Sect. 4. Housing in Winter between latter end *September* till beginning *May*, giving them fresh Earth as they retire, and expose them *i. e.* takes out the upper exhausted, stirring that below with a Fork (not wounding the Roots) and puts in its place, some rich and well consum'd soil, watering on all occasions with Water, wherein Neats dung is steeped (not touching leaves or stem therewith,) whereof they are sparing while remaining in the House,

except after long frosts, in whose extremity is used a little Charcoal free of smoak sunk a little in the Floor, and in warme dayes free of frosts and fogs, acquainted with the Air, but shut close at night again: and when they may expose to the free Air, yet even then sets them a week in the shade, having first brused them from dust, &c. For my part I rather be in the Woods, Parks, Orchards, Kitchen Garden or fields measuring, planting, and improving the ground to best advantage. However I will here take a little turne among the Flowers.

3. Of Fibrous Rooted Flowers.

July-flowers are the best, and are increased by offlets, layers, slips, and seeds. A light loamy Earth well mixt with rotted soil of Cowes and Sheep, a year before hand.

Albeit I have raised many double by seed of my own reaping; yet the surest way to preserve the best, is by laying, because seedlings are apt to dy after they have born a Flower: how to lay see Chap. 1. Sect. 6. Plant out your layers at spring, and give these in Potts fresh Earth as the Orange-tree, and yearly cleanse the old Roots of withered, dead, and Rotten leaves, and leave not above 3 or 4 Spindles for Flower, (if choice) and nip off superfluous buds lest they blow and bear themselves to death: and if any burst slit, as I directed with double Yelow Rose. At midsummer shade from afternoons Sun a little these that blow, support them against winds, set hoops amongst them for catching erwigs their enemies; Water well in drought, sparing their leaves, preserve the Choice from too much Raines by laying the Pots on their sides, strick off the Snow when it lyes too weightie on them, these you will not to bear seed, cut their stalks as soon as past the Flower.

Stock July-flowers by seeds or cuttings; the seed of single will produce double, but the more leaves the Mother hath, the doublet shall the product be; sow and plant with carnations or July-flowers, they affect a soil with them.

Prim-roses, Couslips, and bears-ears by offlets in the spring, & when the Flower is past, (*viz. July*) they affect a good natural Earth



Earth well mixt with rotten Neats dung : the finer sorts loves a little shade in summer, if in Pots or cases you may transport them to such at pleasure.

Great varieties may be raised from seed sown in Pots, the soil aforesaid mixt with willow Earth in *October*, take head of deep interring bairs ears, sow them as purslain : set the Pots and cases with them at the Southside of a Wall till *Aprile*, at which time they spring, and must be now retired a little as is said; transplant in *July* to Flower next spring, and neglect not to Earth up such as are apt to work out of ground namely bears ears.

There is many other as

Noble Liverwort, Spring Gentianella, Virgines-bours, &c. and ar Increased by offlets in the spring or by seeds at the same time. As also Columbins, Holihooks, Cransbill, Campions, and Constantinople Flowers, Catch Flies, Pinks and sweet Williams, Throat Worts, and Bell Flowers, &c. Or Daisies, Violets, Spider Wort, double Marth, Mary-gold, by offlets any time when springing.

Of Bulbo and Tuberous Roots there is

Tulipas of great varieties, Increases them by offlets when their stalkes withers, which is generally about *June*, *July*, *August*; this is also the season for other bulbo and tuberos Roots; keep them in a cool but dry place till *Sept:* or *Octob:* and then plant them in a light sandy earth with fat soil an Inch below the bulb, so that the roots may reach it, remove every three years and oftener if they affect not the soil: they may be raised from seed but its tedious.

Anemonies the same very way as Tulips, except that they require a rich earth mixt with Rotten dung so that it be not Rank.

Apply this also to Ranunculases of the finest sorts.

Cyclamin Roots may be carefully parted in *July* and set in the soil for Tulips.

Crocuses and Chalcicums as Tulips, but requires a mixt rich light soil. And so with

Iris Bulboles (but loves a dry bed) and Narcissuses, Ornithog-

lams,

lams, Jacenths, Hefons, Aconits, Hellibors, &c. Likewyes Iris Tuberosus, Crown Imperial, and Lilies of severall sorts, Pionies, Cynosorches, &c. —

Indian Tuberoſe is tender. See Esq: *Evelin's Kalendar*.

There are many Annuals may be ſowen in pots, and plunged in hot bed, and ſome under glaſs covers eſpecially them ſowen in Autumne, as

Amaranthus, Marvel of *Peru*, flos Africanus, Convolvulus, &c. In *Aprile* you may ſow them on the cold bed, if good far warme earth, together with double Marygold, Cyanus, Nigella, Delphinus, Anterhinum, double garden and Corne Popies, Fox Gloves, Flos Solis, Flos Adonis, &c.

But if you would be further ſatiſſied in the varieties of plants, conſult the Learned and moſt Ingenious Mr. *James Sutherlands* Catalogue Phiſick Gardner at *Edinburgh*.

4 I ſpoke before of preſerving plants by houſing. There is ſome that cannot endure the houſe, who muſt be ſet at the South wall, the potts ſunk three Inches below the ſurface, covered with glaſs, firſt clothing them with ſweet and dry Moſs: or in prepared boxed beds with folding Glaſs frames to liſt up and down at pleaſure; becauſe in all ſeaſonable warme blinks of the Sun & ſhoures they may be diſcovered of all that covers them, thus: Treat choice Ranunculus, Anemones, Amaranthus, &c. Neglect not to repair their earth as (in ſect: 2) the Oreng Tree.

Plants ſtanding dry in Winter, earthed up, or the Earth made firme about them are good means of preſervation. Neglect not to cleanſe all your plants of under and withered leaves, ſuperfluous offſets, &c. See Chap. 1. Sect. 10. and ſee Part 1. Chap. 6. Sect. 7. For the orderly planting of Flowers. And I hope the Reader will excuſe for this brevity, ſeeing each Chapter herein would merit a Book, neither will leaſure permit me at preſent.

A N  
A P P E N D I X

*Shewing how to use the Fruits of the Garden.*

1.



HIS necessarily depends upon the 5th and 6th Chapters, of Fruits and Herbes eatable.

Gather Aples and Pears when full ripe, especially these for keeping, or for Cyder in a dry day, clear but not frostie, in large Baskets lin'd with Straw Matts, upon the 3 footed or standing leathers: at least lay Straw under, if you shake them, and suffer not too

many at once thereon.

Gather Apricocks, Peaches, Plumes, Cherries, with your hands into clean Baskets, when full ripe, whither for eating Green, preserving in Sugar, &c. drying, or for Vines; as also currans, Barberries, Raspberries, -Goosberries. The Cucumbers for pickling must be small *i. e.* e're their seeds grow firme; as Goosberries for baking, boyling, sauces.

Artichocks e're they grow too hard, let these for pickling be tenderest. Let the purslain for pickling be hard and old, lay it a day or two in the Sun to mornifie. That which you eat Green must be tender. Eat Beans and Peas Green, but do not slice down the Beans, nor break the Peas stalks, else them left thereon cannot fill. You may cut off the Beans with a Knife; and for the Peas, hold with the one hand and pull with the other.

Asparagus when tender *i. e.* about 3, 4, or 5 Inches high.  
Lettice

Lettice when young, but its best Cabbaged. Succory, Endive, Sellery Blanched. Cresses, Parsly, Chervil, Burnet, when young and tender. Sorrell, Spinag, beets before they shoot for seed. And so is Arage, Marygold, Bugloss, Burrag. Shallot and onions when their stalks withered, tho shibols are eaten green. Leeks any time before they shoot to seed. Coleflowers when firme and white e're they spoil; And so cabbage when hard. Sweet herbes any time either green or dryed, but gather them in their prime for drying.

Liquorish no dish but drink. see Chap. 6. Sect. 4. where you will also find season of Scorzonera, Beetrave, Carrot, Turnep, Skirret, Parsneep, Potatoes, &c.

2. Besides what is said above of planting and sowing at Spring, summer, and harvest for somes longer continuance, as also of raising some earlyer than naturally, by means of hotbeds, and what I might say of retarding others by transplantations, &c. There be wayes of preserving them out of the garden, &c.

Apples and Pears may be carryed into the conservatory or storehouse in the large baskets between two men; which must be a close but cleanly and wholesome Room floored, lyned, and siled with boards and shelves of the same round: let them sweat a little on the floor with clean oat straw under them; then dry and lay them Aple-thick on the shelves, opening the north windows in fair, clear, windy dayes, especially at first that it may dry up the superfluous moisture. turne them sometimes, and in frosts cover them with matts, and shut close the house: some of the choice you may wrap in dry papers singly, and often visit, that you may remove any that begin to rot: for they quickly affect the rest.

The way of preserving Cherries, Plumes, &c. In Wine, Cyder, Hony, or sugar is easie, as also of drying them in the oven.

And you may pickle barberries in Vinegar, and salt well dryed, and sugar: to each pound and a half fruit, a pound of salt cold again,

again,  $\frac{1}{2}$  pound sugar beat to powder; put them by layings in a well glazed Earth pot, and when they have stood a whole week well stoppt pour in a mutchken Vinegar to each pound fruit; if you find the sawces too sharp put as much sugar as salt.

Range cucumbers the same way, and strew salt, and Vinegar till they be all covered, and you may add a little dill and sweet bay leaves for odour, and cover them close 40 dayes unbroken: then pare when you serve them up.

For Artichocks dissolve two large handfuls of great Salt (that is dried on the fire in a pan) in one mutchken Vinegar and three of fair water, mix them while the Salt is yet hot, (but put not the liquor on the fire) boyl the Artichocks till the leaves come off easily, and while the cleansed stools are yet warme, you may have 3 nutmegs, 3 drop cloves,  $1\frac{1}{2}$  dram mace,  $\frac{1}{2}$  ounce white pepper,  $\frac{1}{2}$  ounce cinamon, beat to fine powder and strew upon them; then pack them in the pot with five or six spoonfuls the liquor on each stratum: when all potted poure on the rest of the pickle, and stop close.

To pickle them green put to every pound of cleansed stools an ounce Salt dried and  $\frac{1}{2}$  ounce spices last nam'd mixt in a mortar; and having dawbed the stools full of holes, throw the powder thereon, when the pot is full, melt as much butter as cover them over two Inches, and when cold, cover close with leather.

To pickle Beet-raves, boyl and put them in glazed pots, with whole pepper and as much Vinegar as cover all over, stoping them close.

Asparagus may be parboyled and pickled as Artichocks: and so may green peas with cods.

Purslain as Cucumbers: and so may taragon, sampeit, broom-huds, &c.

Lettice, Endive, Sellery, &c. By blanching and Ranging among sand in Cellers. Cabbage by Hanging. Roots by Housing, Sanding, &c. As is shewed in Chap. 6. Sect. 2. and 4. Sweet her-

bes as well as physicall by Hanging to dry in some open Room not in the Sun as some advise.

Put marygold flowers in paper bags near the chimney till they pass hazard of mouldiness; do just so with true saffron. But because few knows how to order it, observe, to part its off-sets and plant with other bulbs at half foot distance in the beds or bordurs, it flowers in *Septem*: then be careful to go through in the mornings and gather the saffron *viz*: the thrums that are in the middle of the flowers, it bears not well till the 3d, 4th and 5th year; then you must remove it. But to the matter in hand.

3. As for the use of these fruits, the physicians knowes their medicinalls, the cook their ordering in the Kitchen, the Gard'ner how to propagate and Improve them. For description and medicinal uses see our Countrey-man Doctor *Morisons* herbal; and for mechanicall uses, *Evilins* works.

To have dishes and drinks of them observe what followes.

4. Of dishes, as of Apples you may have baked without any ingredients save sugar, Roasted alone, and so boyled, fryed by shavers, with a little fresh butter, stew'd betwixt two plates, having cleaved and taken out their coss, add a little sweet butter and sugar. Of Pears you may have Roasted and boyled as Apples, also stowed being cut in fower and put dry in a stoup or oven of white Iron; and so set in the pot among water to boyl, you may have both Apples and Pears green with cheise.

Cherries are excellent baked, and so gooseberries. Apricocks, Peaches, Plumes, Cherries, Currans, Gooseberries, Raspberries are all excellent dishes green, or conserved. Strawberries and Red wine, or sweet cream.

Cucumbers pickled for sallad to roasted mutton: or if ripe, slice and lay them an hour in Salt, and so powr off their water. Artichocks are either pickled or fresh, boyled and eaten with sweet beaten butter.

Beans and peas boyled with savory and thym fagot, served up with sweet butter beat amongst them, and set a little on a coal or chaffing.

Boyl



Boyl *Asparagus* in fair water, and serve it up with a little sweet butter; beat *i. e.* tumbled in the Sawce-pan above the coal. The young shoots of colworts will serve the same way.

Purslain may be eaten green with sugar and Vineger, or Oyl, stew'd with meat, besides the pickled.

Lettice green as purslain; and so cresses, Chervil, Burnet, burrage flowers, and wood sorrell.

Spinag is excellent stoves being boyled with lamb or Veall with a little sorrell therein, as also clioped dishes thereof with butter.

The same way use beets; also make green broth of them with leeks, fagot of thyme and parslly. In some stoves and broths you may put Arag, Marigold leaves, Violet leaves, Straw-berrie leaves, Buglose, Burrage, and Endive. In Pottage put Juice of sorrell, fagot of thyme and parslly, and in most of broths.

In the sawce or gravy of Rost mutton and capon and in all stewed dishes bruise shallot or Rub the dishes therewith.

You may stove leeks with a cock. Onions may be baked with a little butter if you want meat: also make use of them with rost meat especially geese, and to most fresh fishes in which parslly and thyme fagot is mainly used.

Boyl colesflowers in water mixt with a little milk; then pour it off and mix them in the stew-pan with sweet butter seasoned with salt, and so serve them up about boyld mutton.

Boyl Cabbage with Beef, reserving the top of the pot to powr on (when dished up) about the beef.

Boyl Scorzonera, peel off its broun rind, wherein consists its bitterness, slice and fry it with butter.

When skirrets are boyld and pealed, Roll them in flowre, and fry with butter.

Boyl and peal parsneps, chop and bruise them well, powre on butter, and set them on a coal, and if you please strew a little cinnamon upon them.

Carrots are so used or only dished by shavers. Beet rave boyld  
R 2  
peale

pealed, shaved, and when cold served up with vinegar and sugar: besides the pickled.

Beet-raves, Parsneeps, carrots are very good served up whole or sliced about meat, as turneeps usually with fat broth poured thereon.

Potatoes as Parsneeps: or for want of butter take sweet milk.

5. Of drinks, as of Apples to make cyder: I cannot name our cyder Apples, for I use to mix all the ripe at once in the orchard, that is of a fine Juice and easie to separat from the flesh, and pears that have plenty of Juice and hard flesh though harsh.

In France they extoll the Rennet cyder, in England the Hereford Redstrake. (Which in France they set at naught) they speak of genetmoil and musts, some pipens and parmain. And for Perry the bromsbury, and Ruddy horse pear. All which and many more *Hugh Wood* Gard'ner at Hamiltone has to sel. But now the different soils begets alterations in fruits besides the climate; yet both defects may be a little helped: The first by using all diligence to prepare the ground thoroughly, as is directed in Chap. 2. Following is a most commendable essay.

The second by grafting and re-grafting upon early: good fence and shelter round the ground are very conducive.

To make this excellent Wine, provide trough and beaters, press and harbag, lagallon and tapping fat, barrels and hog-heads; (for even by the common screw press I have made a hoghead cyder in a day) be sure your vessels be sweet, else you spoil all; white Wine, Sack-cask or such as keepe cyder before. I have heard of cyder-cask; Inches thick in the staves, which I believe is of great Advantage in preserving the liquor: but if any be tainted, put a little unstaked Lyme Stone, and a little water in the Barrell, and stop it close; when stood a little while and jumbled, pour out and wash clean, that will cure.

The fruit being gathered ripe, as before, let them ly ten or twelve dayes, if summer fruit; and near the double of that time, if winter sorts: (but the late ripe that gets frosts is not good cyder)

cyder) mix not with unripe ones, neither suffer leaves nor stalks among them. When they are small beat, put them in the harbag within the press fat, and so screw them hard again and again; and emptie it thereof and put in more, and do as before: and empty the receiver into the tapping fat, and therein cover it close with a canvass till the morrow at that time, before you tun it; where the gross lee may fall to the bottom, then draw it off at a tap three Inches from the bottom, leaving that dreg behind. (The which may go among the pressings for water cyder) the clearer you tun it into the barrels, the less it ferments, and that's best cyder: for often cyder spends its strength to free it self of the grosser parts; therefore while your cyder ferments, leave the vent pin loose, but keep close the bung for preserving the prodigall wast of its spirit; and as soon as the working begin to allay, drive the vent pin dead to: and this will be perhaps in a fortnight, if it begins to work Immediately, some times not till the Spring. But keep fast the pin till it begins to work, and that you mind to bottle of it, do as soon as fully clear and fine; which is ordinarily at Spring. Put a plum great of fine white loaf sugar in each bottle, and above all, make your corks fast and close; then set them in the celler amongst sand.

To make the water cyder put  $\frac{1}{2}$  as much water as you had cyder upon the new pressed marce, to stand covered in tubs 4 or 5 dayes: then press them and boyl the liquor, scumming it till the scum cease to rise fast, then take it off (for too much boyling wasteth its spittits) and put in tubs or coolers, and when cold tun it up; when done working (which will not be so violent as best cyder) make the pin fast and in a short time its for drinking. A little ginger, cloves, juniper berries or such may be boyl'd in it, if they please your tast.

The making of Perry differs not from that of cyder.

To make Cherrie Wine, to every pound ripe fruit stamp, put a Chopin Spring-water and  $\frac{1}{2}$  pound fin white sugar, boyl the water and sugar, scum it and put in the juice of your Cherries, let it boyl up again, take it off the fire, run it through a hair-sive and when its thoroughly cold, put it in a stone pot, and after 6 or 7 dayes

R 3

draw

draw it into bottles, putting a bit loaf sugar in each; in a quarter year you may fall a drinking, it will keep a year; if you would have it stronger, then use no more water than sugar.

After the same manner you may make wine of Rasps, Currans, Goosberries, or

Take currans very ripe, bruise and strain them, and to every pint of the Juice put a pound and  $\frac{1}{2}$  sugar into a stone or earthen pot, scum it often, and at a weeks end draw it off, and take out the settlings and put in the liquor again; do this till it be fine, then bottle it; and at a weeks end if it be not fine in the bottles, shift it into other bottles.

Gather your Goosberries e're they be too ripe, and for every three pound stamp fruit, a chopin of water and a pound sugar: steep them 24 houres, then strain them, put the liquor into a vessell close stopt a fortnight or three weeks, then draw it off if you find it fine, otherways suffer it longer; and if not fine yet rak it.

Its usuall to make it thus unboyl'd, because it contracts a brown colour in boyling.

To every pint Rasps a pound sugar, let them stand two dayes in an earthen pot, often stirring and bruising them; then put them in a woollen bag to hang up 24 houres and more till the liquor drop out into a stone pot, suffer it there till fermented and scum'd, and at a weeks end (or sooner if fine) bottle it, and at another weeks end shift it into fresh bottles, that you may leave the settlings behind: thus shift them so long as you see any sediment, the which you may put in a bottle by it self.

Of some sorts of Plumes, as damask, &c. may be made wine.

That called Cherry brandie, is a bottle half full of greens, fill'd up with brandie, sometimes Jumbled a little; and in a moneths time is fit for drinking. Or if you put the like quantity of Goosberries instead of Cherries; that will make the brandie very Delicicus.

Cherries best for wine are blackheart, morella. I think the red

red geen most excellent. See Chap. 3. Sect. 2.

Of Gooseberries the great Chrystal, and of currans the great Dutch red, also the red Rasp.

To have Ail of Liquorish, slice it very small and pour Water on it when at the boyl: there cover it close till the morrow, powr off this wort, and on more hot-water, to stand as long to search it throughly; add your worts together and boyl with a little dry Wormwood *Carduus Benedictus*, but the greatest difficulty is to barme it when cold, as wort of malt; yet the stronger you make it, the easier it will take, or if you have the conveniency of settlings of good wort of malt to boyl with it; that will facilitate the work.

To have good metheglin, take one part of clarified Hony and eight parts of pure Water and boyl well together in a Copper vessel till the consumption of the half: but while it boyls take off the scum, and when done boyling and begins to cool, tun it up, and it will work of itself; as soon as done working, stop it very close. Some advises to bury it under ground three moneths, and that to make it lose both smell and tast of Hony and Wax, and tast very like Wine. I use to add dry Rosmary and sweet Marjorum in boyling: some barme it as Ail; which I have practised effectually.

6. To know what Fruits and Herbes to make choice of for our plantations:

The *French* Fruit succeeds not well with us, in *England* are good Apples, but *Holland* for *South* fruit especially Peaches and Cherries, and *Scotland* for Pears.

The best Apple for the Table is the Golden Pepin; we have also Rennets, Russers, &c. very good. And for the Kitchen the Codling, Lidington, and Rubies, with hundreds for both.

But the best Pears for the Table are *English* Bergamot, Swan-egg excellent Pears, and red Pear Achans, &c. The wardens are good Keepers and Kitchen Fruit, and multitudes more.

Of Cherries, the Kentish, and Morella, &c.

Of Plumes, Primordials, Mussell, Imperial, &c.

The common and Orange Apricoks, the newington and nut-

nutmeg Peaches, (Peaches bears better with us than Apricocks.)

The *Portugall* Quince, and thinshell'd Wallnut.

Of Goosberries great White, great Red, and great Yellow.

Of Currans the great red *Dutch*, early red, and the white.

Of Rasps, both the white and red.

The great red Straw-berrie, and the *Virginian* which is more early.

Of Artichocks both the great and the prickly.

Great white Beans, and white Kidnees. Of Peas Barnees, Hors-pures, Hasties, and the sickle Peas, &c.

If you can get *Horidium nudum* that is naked barley, and sow as I directed with Peas, it yealds an incredible increas.

The *Dutch* Asparagus and Cabbage lettice. The forrall that usually shoots not for Stoves, &c. And Yellow wood and *French* for Sallades. The white Beet and smooth Spinage. Curled Parsly and Cresses. Shallot and Roccumbol, *French* leeks, and *Straws-brugh* onions.

*Candy* Cole-flower and our own great *Scots* white Cabbage.

Crisp Tanfie, and curled Spearmint. Sweet Fennell, and common Rosmary. Sweet Marjorum and red Sage.

The black Scorzonera and Orange Carrot. The small round smooth Turnep. Smooth *Dutch* Parsneep and small Radish clear as Chrystall. See Chap. 6. for more.

Its to be noted, that the ingenious and most industrious, *Hugh Wood* Gard'ner at *Hamilton* can accommodate you with the above mentioned Fruits, together with a great many of other sorts, whither *English*, *Dutch*, or *Scots*.



# THE CONCLUSION

*Proposing SCOTLANDS Improvement.*

**T**Here is no way under the Sun so probable for improving our Land as Incloſing and Planting the ſame: Therefore I wiſh it were effectually put in practice.

F I N I S.

*Because of the Authors abſence there are ſeveral things eſcaped the preſs: wherefore the Reader is earneſtly deſired to amend theſe here marked, viz.*

Fig. 1. line 22. theſe garrets Read theſe. Garrets Fig. 3. l. 20. Centre at leaſt, the 2. Centre, at leaſt the Ibid l. 31. confinements 2. confinements P. 9. l. 21. 90 degrees 2. 60 degrees P. 11. l. 20. fig. 22. of fig. 2. P. 17. l. 17. Pole 2. Pole ſo P. 27. l. 9. from by hawing. 2. from weeds by hawing. Ibid l. 11. train 2. trimm P. 28. l. 25. ſide, each 2. ſide of each P. 32. l. 3. drawing 2. draining. Ibid l. 18. recovering, 2. recounting, Ibid l. 24. conveniency; in viewing there 2. conveniency in viewing; there P. 33. l. 9. make 2. marke P. 35. l. 25. know reaſon 2. know no reaſon P. 36. l. 23. move 2. more. P. 45. in the example of diviſion the figures above the dividend ſtands one place too far towards the right hand P. 52. l. 26. 23. 2. 32. P. 60. l. 10. Circumpoſition 2. Circumpoſition Ibid l. 37. ſow 2. ſew P. 61. l. 32. by 2. be P. 70. l. 16. healy 2. heathy P. 71. l. 3. ſeed in the wood, they 2. ſeed, in the wood they P. 84. l. 24. ſell them 2. fell them (ſe. 10. of a Tree) P. 89. l. 28. marie 2. marce. P. 92. l. 17. know 2. knew The Page ſhould be 96. l. 2. Peacocks; train, (ſpread, 2. Peacocks train ſpread; P. 96. laſt line head the 2. head the P. 105. l. 20. 2. 22. Ibid l. 28. diſtance from another. 2. diſtance: another P. 105. l. 7. gnaws 2. gnaws Ibid l. 29. Balme. 2. Bawme, P. 112. l. 33. 2. 20. P. 113. l. 29. Ranunculines 2. Ranunculus P. 113. l. 21. 2. 20. Ibid P. 122. l. 4. ſow 2. ſew

THE  
NATIONAL  
GALLERY  
LONDON  
1854

THE  
GARDNERS KALENDAR

*Shewing*

The most seasonable times for performing his  
H O R T U L A N A F F A I R S,

Monthly throughout the Year:

A N D

*A Catalogue of such dishes and drinks as a compleat Garden  
can afford in their seasons.*

---

Published for the Climate of SCOTLAND

By J O H N R E I D Gard'ner.

---



---

EDINBURGH,

Printed by DAVID LINDSAY, at the foot of  
*Heriot's-Bridge, 1683.*

THE  
SCOTTISH GARDENER  
BY  
JAMES WATSON  
OF  
GLASGOW  
READER,

**A***S in this little Kalendar thou wilt find when ; so in my Book (Intituled the Scots-Gard'ner) thou wilt find how, to performe the particulars.*

*The Gard'ners year is a circle as their labour, never at an end. Nevertbeless their terme is*

# NOVEMBER.

**C**ontrive or forecast where, and what you are to sow and plant. Trench and fallow all your vacant grounds. Prepare and mix soils and composts thoroughly: mifs not high-way Earth, cleansings of streets; make compositions of dungs, soils, and lyme.

Lay bair Roots of Trees that need, and dung such as require it. Plant all fruit Trees, Forrest-trees, and shrubs that lose the leaf, also prune such. Plant cabbage. Sow halties for early peas in warme grounds but trust not to them.

Garther the seeds of holly, yew, ash, &c. Ordering them as in Chap: 3. furnish your nurseries with stocks.

Shelter tender evergreen seedlings. House your Cabbag, Carrots, Turneeps: and any time e're hard frosts your Skirrets, Potatoes, Parsneeps, &c. Cover Asparagus, Artichocks, as in the last moneth. Sow bairs-ears, plant Tulips, &c. Shut the conservatory. Preserve your Choicest Flowers. Sweep and cleanse the walks of leayes, &c. Stop your bees close so that you leave breathing vents.

*Garden Dishes and Drinks in Season, are*

Cabbage, Coleflower, Onions, Leeks, Shallot, &c. Blanched Sellery, Succory. Pickled Asparagus, Purslain, &c. Fresh Parsneeps, Skirrets, Potatoes, Carrots, Turneeps, Beet-rave, Scorzonera, parsy and fennell Roots.

Aples, Pears, &c.

Cyder, Perry, wine of Cherries, Rasps, Currans, Goosberries, Liquorish, Hony, &c.

# D E C E M B.

**T**rench and prepare grounds. Gather together composts plant Trees in nurseries. and sow their seeds that can Endure it.

Gather Firr seed, holly berries, &c. Take up liquorish. Continue your care in preserving choice Carnations, Anemonies, and Ranunculuses from Rains and frosts. And keep the green-house close against the piercing colds. Turne and refresh your fruit in a clear and serene day. Sharpen and mend tools. Gather ozers and hassell Rods and make baskets in stormy weather. Cover your water pipes with leitter lest the frosts do crak them, feed weak bees.

## *Garden Disbes and Drinks in season.*

Colworts, Leeks, &c. Housed Cabbage, Onions, shallot. Several dried sweet herbes. Housed Parneeps, Turnceps, Skirrets, Carrots, Potatoes, Beat-rave, Scorzonera, parslly, Fennel Roots. Pickled Cucumbers, Barberries, Artichocks, Asparagus, Purslain, &c.

Housed Apples, Pears. Conserved Cherries, Plumes, Peaches, Apricocks, &c.

Wine of Apples, Pears, Cherries, Liquorish, Hony, &c.

JANUARY.



# JANUARY.

**P** Repare the ground, soils and manures. Fell trees for mechanical uses. Prune Firrs, plant Hawthorn Hedges, and all Trees and Shrubs that lose the leaf weather open. Also prune the more hardy and old planted. Dung the Roots of Trees that need, draining excessive moisture, gather Grasss e're they sprout, and near the end Graff; begin with the Stone Fruits. Gather Holly-berries, Firr-husks, &c. Secure choice plants as yet from cold and wet, and earth up such as the frosts uncovered.

Feed weak bees, also you may remove them.

## *Garden Disbes and Drinks in season.*

Coleworts, Leeks, &c. Dry sweet Herbes. Housed Cabbage, Onions, Shallot, Parsneeps, Skirrets, Potatoes, Carrots, Turneeps, Beet-rave, Scorzonera, Parsly and Fennel Roots in broth.

Pickled Artichocks, Beet-raves, &c. Housed Aples, Pears, and other conserved Fruits.

With Cyder and other Wines as before.

# FEBRUARY.

**P**lant any Trees or Shrubs that lose the leaf, also lay and circumpose such for increas, see *June*. Likeways sow all your Seeds, Kyes, Kirnells, Nuts, Stones; also the seeds of several Greens, as Holly, Yew, Philyrea, Laurels, &c. Prune Firrs, &c.

Continue to destroy Vermin.

Grafting is now in season, see the last moneth.

Prune all Trees and Shrubs except tender Greens. Nail and dress them at the wall. Cover the Roots of Trees layed bair the fore-end of Winter, if any be. Plant Hawthorn Hedges, Willows, &c.

Plant Liquorish, Potatoes, Peas, Beans, Cabbage. Sow Parsly, Beets, Spinage, Marygold, and other hardy Pot-herbes.

Let carnations and such sheltered Flowers get Air in mild weather. But keep close the Green-house.

Now you may remove bees and feed weak stocks.

*Things that may be sown in the open ground in February.*

*Garden Dishes and drinks in season.*

Cole, Leiks, sweet Herbes. Onions, Shallor, housed Cabbage, Skirrets, Turneeps, Parinceps, Potatoes, Beat-raye, Scorzonera, Carrots, besides Parsly and Fennell Roots.

Pickled Beat-raye, Artichock. Cucum: Housed Apples, Pears, and other conserved Fruits with Cyder and other Wines and drinks, as above.

---

MARCH,

# MARCH

**R**edelve, mix, and Rake your ground for Immediat use. Delve about the Roots of all your Trees. Yet plant Trees and rather greens. Also prun such except the Rosinious. Propagate by laying circumposition, and especially by cuttings. Sow the seeds of most Trees and hardy greens. Cover these Trees whose Roots lay bare, and delve down the dung that lay about your young Trees all winter, covering on leitter again topt with Earth to prevent drought in summer: this is a material observation and more especially for such as are late planted. Slit the bark of ill thriving Trees: fell such as grow crooked in the nurserie. Graffing is yet in season, (but too late for stone fruit) cut off the heads of them inoculated.

Set peas, beans, Cabbage, Asparagus, Liquorish. Sow parslly, beets, Endive, Succory, Bugloss, Burrage, Sellery, Fennell, Marigold. Plant shallot, garlicks, Potatoes, Skirrets. Sow Onions, Lotties, Croffes, Parsneep, Beet-rave, Radish, &c. And on the hotbed colesflour, and if you please cucumber, &c.

Slip and set physick herbes, *July*-flowers, and other fibrous Rooted flowers. Be carefull of the tender, the peircing colds are now on foot. Turne your fruit in the Room but open not yet the windows.

Catch Moles, Mice, Snails, Worms, destroy frogs spawn, &c.

Half open passages for bees, they begin to fix, keep them close night and morning: yet you may remove them.

## *Garden Dishes and Drinks in season.*

Both green and housed herbes and Roots: also Pickled, Housed, and conserved fruits: with their wines as in the former months.

APRILE

# A P R I L E.

**P**lant Holly Hedges and Hawthorn too if not too forward. Ply and sheer Hedges. Nail and prun Wall-trees, &c. Sow and plant firs, and other greens. Slip and set sage, Rosemary, thym, Rue, Savory, and all fibrous Rooted herbes and Flowers. uncover and dress strawberries. Plant Artichocks, slip them and delve their plottes. Set Cabbage, Beans, Peas, Kidnees, sow Asparagus, Parsly, Beets, and Beet-card. Set Garleeks, Shal-lot, Potatoes, Skirrets, Sorral. sow Onions, Leeks, Lettice, Cresses, Radish, Orach, Scorzonera, Carvy, Fennel, &c. And on the hotbed Cucumbers, Coleflowers, Purslain, sweet Marjorum, Basill, Summer Savory, Tobacco, &c.

Set Strawberries, Violets, July-flowers, &c. Also sow the seeds of july flowers. &c. Sow all your Annuall flowers and Rare plants some requiring the hotbed. Destroy Moles, Mice, Worms, Snails. Lay, Beat, and Roll gravel and grafs. Fall to your mowing and weeding.

Open the Doors off your bee-hives now they hatch.

## *Garden Dishes and Drinks in season.*

Onions, Leeks, Colworts, Beets, Parsly, and other herbes: Spinage, Sorral. Scorzonera, green Asparagus, Lettice and other Sallads. Pickled Artichocks, Beet-rave, Barberries, Cucumbers.

Housed Apples and Pears, Conserved Cherries, Plumes, Peaches, Apricocks, Goosberries, Currans. Also the wines of Apples, Pears, Cherries, Liquorish, Hony, &c.

MAY.

M

A

Y.

**P**ull up suckers and haw about the Trees. Rub off unnecessary buds. Sheer or clip Hedges. Prun tender Greens, (Not the Rosinious) bring furth the houfed ones refreshing & trimming them. Plant all sorts of medicinal Herbes. Sow all sweet ones which are tender.

Gather Snails, Wormes, catch Moles.

Sow Letice, Cresses, Purslain, Turnep, Radish, Peas, &c. Continue weeding and watering.

Near the end watch the Bees ready to swarm.

*Garden Dishes and drinks in season.*

Coleworts and other Herbes, (being eaten with contentement is better than a fatted Ox without it) sage (with Butter,) Leeks, Parsly, Thyme, Marjorum, sorrell, Spinage, &c. Scorzonera, Asparagus, Letice, Purslain, and other Sallades and Pot-herbes.

Pickled Artichocks, Barberries, Beet-rave, Cucumbers, house-d Apples and Pears for many uses. Early Cherries, Strawberries, near the end.

Cyder, Metheglin, Liquorish Ail, &c.

B

JUNE

# J U N E.

**C**leanse about the Roots of Trees, Suckers and weeds, water their Covered Barks: especially the new planted.

Fell the long small ill-train'd Forrest-trees in the nurserie within half foot of the ground. Unbind grasses. Prun all Wall and Standard Trees. Towards the end you may Inoculat. And Increase by circumposition.

Gather Elm seed and sow Immediately.

Transplant Coleflowers, Coleworts, Beets, Leeks, Purslain, &c. In moist weather; at least water first the ground if dry.

Sow Peas, Radish, Turnep, Letice, Chervil, Cresses, &c.

Destroy Snails, Worms, &c.

Begin to lay carnations or July-flowers: shade, support and prun such as will blow. Water pots and thrifty plants. Weeding and mowing is in season, and so is distillation.

Bees now Swarm, look diligently to them.

*Garden Disber and Drinks in season.*

Cole, Beets, Parsly, Sorrell and other Pot-herbes. Purslain, Letice, and other Sallads. Radish, Scorzonera, Asparagus. Green Peas and Artichocks. Green Goosberries. Ripe cherries, Ralps, Currans, Straw-berries.

Housed Apples and Pears.

Cyder, Metheglin, &c.

JULY



## J U L Y.

**F** Allow ground as soon as the crop comes off. Prune and purge all Standard-trees. Ply, Nail, Prune, and dress your Wall-trees. Pull up suckers and weeds. Haw and Water where needful. Inocular Fruit-trees, Shrubs, rare Greens, Flower-trees; Increase the same by laying. Clip your Hedges after Rain. Suffer such Herbes and Flowers to run to seed as you would save: Cutting the rest a handful from the ground.

Sow Turnep, Radish, Lettice, Onion, Cole-flower, Cabbage, and Coleworts in the full Moon. Near the end sow Beets, Spinage, &c. You may plant Strawberries, Violets, Camomile, Lay July-flowers. Plant their seedlings. Slip and set Hypaticas, Bears-ears, Couflips, Helibors, &c. Take up Bulbo and Tuberos ones that are dry in their stalks (if you mind to change their places) and keep till *September*, but some would be set immediately.

Supply voids with potted Annualls. Lay Grass and Gravell. Make Cherrie and Rasberrie Wine, &c.

Prevent the Bees latter swarmes, Kill Drons, Wasps, &c.

*Garden Dishes and drinks in season.*

Beets and many Pot-herbes and Sweet-herbes.

Beet-card, Purslain, Lettice, Endive, &c.

Cabbage, Cole-flower, Scorzonera, Beetrave, Carrot, Radish, Turnep, Peas, Beens, and Kidnees, Artichocks, Strawberries, Rasps, Currans, Goosberries, Cherries, Plumes, Summer Pears and Apples, Cyder, Metheglin and other Wines.

# AUGUST.

**F**allow bordures, Beds, Nurseries, and the bulks of Trees. **I**ncocular. **P**ly and purge Trees. Pull up suckers and weeds. **C**lip Hedges. **G**ather the Black-cherrie and Morella Stones. **G**ather Mezzerion berries. **G**ather the seeds of most Herbes and Flowers. **C**ut your Physick-herbes. In the beginning of Cabbage (tho I confess its too late. See the last moneth) **B**eans and Beet-card, Spinage, Black-radish, Chervil, Leticæ, Corn-sallade, Endive, Scorzonera, Carvy, Marygold, Angelica, Scurvy-grass, &c. **T**ake up ripe Onions, Garleeks and Shallot. **U**nbind buds Incocular. **C**ut and string Strawberries. **L**ay July-flowers. **S**ow Columbines, Holyhoks, Larks-hoells, Candytufts, Poppies, and such as can endure Winter.

**T**ake up your bulks and plant as in the last. **S**ift the ground for Tulips and Gladiolus. **P**lunge in potted Annualls in Vacants. **K**eepe down weeds by hawing, &c. **L**ay Grass and Gravel, Bear, Roll, and mow well. **M**ake Goosberrie and Curran Wines, &c.

**T**owards the end take Bees, take the lightest first; those who are near heaths may differ a little. **D**estroy Wasps, straiten the passage by putting on the heels to secure from Robbers.

## *Garden Dishes and drinks in season.*

Many Pot-herbes and Sallades, Cabbage, Coleflower, Beet-card, Turncep, Radish, Carrot, Beet-rave, Scorzonera, Peas, Beans, and Kidnees, Artichocks, Cucumbers, Apples, Pears, Plumes, Apricocks, Greens, Goosberries, Currans, Rasps, Strawberries, &c.

Cyder, Metheglin, Cherrie Wine, Curran Wine, Goosberrie Wine, Raspberrie Wine, &c.

# SEPTEMBER

**F**allow, Trench, and level ground. Prepare pits and borders for Trees. Gather plan seed, Almond, Peach, and white Plum Stones. Gather ripe Fruits. Plant forth Cabbage. Remove bulbs and plant them. Refresh, Train, and House your tender Greens. Refresh and trim pots and cases with July-flowers and other fine Flowers and plants, Carrying them to pits, houses, and covert, giving them Air, &c.

Towards the end gather Saffron.

Make Cyder, Perry, and other Wines, &c.

Straiten the entrance to Bee-hives, destroy Wasps, &c.

Also you may now remove Bees.

## *Garden Dishes and drinks in season.*

Varieties of Pot-herbes and Sallades, Cabbage, Cole-flower, Peas, Beans, and Kidnees, Artichocks, Beet-card, Beet-rave, Scorzonera, Carrots, Turneeps, Radish, Cucumbers, Apples, Pears, Apricocks, Peaches, Nectarines, Quince, Grapes, Barberries, Filbeards.

Cyder, Liqueurish Ail, Metheglin, and Wine of Cherries, Rasps, Goolberries, Currans, &c.

## OCTOBER.

**G**ather Winter Fruits. Trench and fallow grounds (mixing with proper soil) to ly over the Winter. Prepare dungs and manures, mixing and laying them in heaps bottom'd and covered with Earth. Plant Hawthorn Hedges; And all Trees that lose their leaves; Also lay their branches. Prun Roses. Garher seeds of Mistle, Hawthorn, Plane, Ash, Beach, Oak, Aple, Pear, &c. Cut Strawberries, Artichocks, Asparagus, covering their roots with dung and Ashes. Earth up Winter Sallades, Herbes, and Flowers, a little. Plant Cabbage, &c. Plant Tulips, Anemones, and other Bulbs. Sow the seed of Bairs-cars, Cowslips, &c. Beat and Roll Gravel and Grass. Finish your last mowing and mowing. Lay bair leopered Tree Roots and remove what harms them: also delve and dung such as require it. Drain excessive moisture wherever it be. Pickle and conserve Fruits. Make Perry and Cyder.

You may now safely remove Bees.

*Garden Dishes and drinks in season.*

Coleworts, Leeks, Cabbage, Cole-flowers, Onions, Shallot;  
Beans, Blanched Endive and Sallery. Pickled Asparagus, Purs-  
&c.

Water-melon, Beet-rave, Carrots, Turneeps, Parsneps, Po-  
tatoes, Skirrets, Artichocks, Cucumbers, Apples, Pears,  
Nuts, Almond, &c.

Cyder, Perry, and Wine of Cherries, Cutrans, Goosberries,  
&c. All sorts of Aquavitch, Metheglin, &c.

F I N I S.

